

# AMERICAN RAILROAD JOURNAL.

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HENRY V. POOR, Editor.

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## American Railroad Journal.

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Saturday, December 8, 1849.

### Iron Ores and the Iron Manufacture of the United States.

Continued from page 673.

#### MARYLAND.\*

The iron manufacture of this State is dependent upon a variety of ores, which are found in different districts. The greatest number of furnaces are situated near the Chesapeake Bay, and draw their supplies of ore from the formation of tertiary clays and sands in their immediate neighborhood. This ore is a carbonate, occurring in two varieties.—Some of these furnaces are supplied also in part or wholly with hematite ores, from the talcose slate and limestone district, which lies a few miles back

\* We commence with this number of the Journal the articles upon the manufacture of iron in Maryland, leaving those of New Jersey and Pennsylvania, which should properly have the precedence in order, until more complete data are procured, particularly of the latter State.

from the coast; and a considerable amount of the same ore is brought from the more distant mines of Lancaster county, Pennsylvania.

On the eastern shore of the bay one furnace, called the *Snow-hill*, is supplied with bog ores, found there in the pine wood district, from which an inferior quality of iron is made at little cost. Prince George county, on the western shore, furnishes also some of the same ore.

At the western extremity of the State, in the bituminous coal field, the *Mount Savage Iron Works* and the *Lonaconing*, and some others on the border of the same coal field, make use of the ores of the coal formation, or of those found in the strata a little below it.

The smelting of iron ores in this State commenced at an early period, and has been successfully and extensively carried on for many years in the vicinity of Baltimore. From the researches of J. H. Alexander, Esq., who gives, in his Report to the State Legislature, on the Manufacture of Iron, an interesting history of this branch of business, it appears that the first operations were in the year 1715, and in 1717 iron was exported. In 1756 there were eight furnaces and nine forges engaged in the business. A list of nine furnaces is given, which were built, went into operation, and excepting two were discontinued before the commencement of the present century. These two, the *Catoctin* and *Antietam* works, situated in the interior, are still in operation.

*Ores of the Tertiary Formation.*—The belt of country bordering the road from Havre de Grace to Baltimore, and thence nearly on to Washington, is composed of highly ferruginous clays and sands. The formation in Baltimore county reaches the waters of the Chesapeake on one side, and the granite and gneiss or serpentine rocks on the other; and as these generally approach near to the head of the numerous bays and indentations along the coast, there is little left for the tertiary strata beside irregularly shaped points of land which lie between the bays and creeks. South of Baltimore county, in Ann Arundel and Prince Georges, the belt of strata containing these ores lies more inland, along the line of the Baltimore and Washington railroad, a strip of flat sandy country in Ann Arundel county intervening between the ores and the coast. In this tertiary formation the most important stratum is a tough clay in which lies the iron ore. This clay is generally of a bluish color, and is then most

favorable for the existence of the ore; when it assumes a white or red shade it is not considered so auspicious. It lies in horizontal layers, commencing at or near the surface and extending to depths varying from six to fifty feet. Between its layers lies the iron ore in small lumps, balls and kidney-shaped masses, precisely as the clay iron stones occur in the shales of the coal formation. The clay itself also is much like the shales in its composition as well as in its slaty structure, and one cannot but be led to extend the causes that produced the one formation with its superincumbent layers of sand and gravel and interspersed lignite, to the production of the more ancient shales with their accompanying sandstones and carbonaceous strata. The lumps of ore are of various sizes; some are so large as to require blasting to be removed. They tend to a horizontal arrangement among the layers of clay, but assume in their position no great regularity. Associated with them are trunks of ancient trees converted into lignite, their original form well preserved until on exposure they crumble to pieces. They stand upright in the clay, or lie horizontally between its strata. At Whittaker's bed, three miles south of Baltimore, a large stem was found in a horizontal position about fifty feet below the surface, three to four feet diameter and sixty to eighty feet long.

The ores are carbonates more or less mixed with siliceous and argillaceous matters. The purest and most esteemed is of a light yellowish or whitish color, very close and compact in its texture, and not so hard but that it is easily scratched with a knife. From its resemblance to the fine grain of a hone, this is called "*hone-ore*." Its face freshly fractured gradually becomes darker by exposure, and in time a crust is formed of a reddish brown color. This crust slowly increases, extending farther and farther in, enveloping the closer grained kernel in its shelly layers. Occasionally the surface of the fine ore is coated with a layer of minute crystals of spathic iron, which give to it a delicate shade like velvet of a black or yellow color. The crevices and hollow spaces sometimes found in the lumps are lined with these fine crystals.

Besides the compact *hone-ore*, there is another variety sometimes found with it in the same bed, called "*brown-ores*." These are more abundant north of Baltimore, the *hone* ores to the south of the city. They resemble some varieties of hematites so much, that hard specimens of them would

pass for this ore; but I believe they are only the purer carbonates which have oxidized and acquired the same composition as the crust these soon obtain by exposure. They do not appear, however, to be so highly esteemed as the fine grained ores, and analyses are wanting to specify the difference between them. The composition of the latter is evidently like that I have given of the similar ore found in the mine of brown hematite at West Stockbridge, Mass.—being about 36 per cent. of carbonic acid, and 44 of iron combined both with the carbonic acid and with 13 parts of oxygen to form a carbonate of the protoxide of iron. By roasting the ore the carbonic acid is mostly expelled, leaving the proportion of iron in the remainder proportionally greater. These mixed ores work easily in the furnace, and with charcoal make iron of excellent quality, whether it be intended for forge or foundry purposes; the hone-ore alone is found to cut the furnace, so that either the brown ores or hematites seem to be required for its most successful and economical treatment. The iron is almost entirely of Nos. 2 and 3, making bar iron, which is inclined to be red-short, and which is consequently in demand at the north to mix with the cheaper cold short iron of New Jersey and New York.

The great clay bed containing the ore is a broken stratum among the layers of sand and other beds of clay, which make up the surface of this belt of country. It is intruded upon and cut off by the sand and gravel and by an occasional stratum of sand stone. There is therefore considerable uncertainty as to the extent horizontally of any of the ore beds, as well as to their depth. Still there is a probability of the clay with its ores being found in any piece of land on its range that comes up to the level it occupies in the neighborhood. To determine its presence and productiveness in ore in any particular locality, small experimental shafts of from 10 to 20 feet depth must be sunk in places around, and the strata thus proved. The first shaft may penetrate a valuable bed of ore or all may fail of finding one. The indications upon the surface can be depended upon to some extent, particularly loose pieces of ore, that have been washed or ploughed out. New discoveries are frequently made, and will be for a long time. No systematic investigations appear to have been prosecuted, and attention is principally directed to those beds already known or incidentally discovered. These are valued at high rates and are principally held by the companies engaged in the smelting business. From the unequal distribution of the ore much uncertainty attends the mining of them, an area of a few rods square sometimes turning out thousands of tons of ore, and acres around proving to be comparatively unproductive. The ore beds being generally near the surface and unprotected by any rock roof, the mining is conducted like railroad excavations—all open to the day and unprotected from the weather. The face of the bank is undermined and broken down, and the ore is picked out by hand from the clay, which is carted back. So the expense of mining depends on the proportion of balls of ore to the clay that is removed and to the facilities of working the banks without trouble from water. This is not often a serious obstruction. On the sea shore near the light house at the Lazaretto, an excavation covering several acres has been carried down even below the level of tide, the sea being kept out by a high bank of the refuse clay, etc., piled around the edge of the workings. The rain water and the little leakage is easily pumped out.

These deposits are seldom worked to their full

depth. They go only so deep as will pay. Beyond there may be more ore covered up than has been taken out. Half a ton of ore to a man a day is considered good work, when wages are \$7 1-2 cts. This would make the mining cost \$1 75 per ton, to which is to be added transportation to the furnace. The 'ore-leave,' too, is another item which is sometimes avoided by the furnace company owning the land. It varies from 25 to 50 cents according to the character and abundance of the ore, and its convenience to the furnaces. As the actual cost of the ore is made up of these uncertain items, it cannot be given with precision. It is to some of the works as low as \$2 50 for a part at least of the ore they use; and others pay as high as \$4 50 for a portion of theirs. Three dollars and five-eighths per ton will not be far from the average cost of the ore at the furnaces; and of this ore it takes from two and a half to three tons to make a ton of iron.

From the nature of these ore beds they cannot be considered permanent. They are occasionally worked out in one neighborhood, and supplies have then to be looked for elsewhere. By supplying the furnace from different beds and using different mixtures, the quality of the iron is made to vary, and some poor cheap ores may in this way be worked to advantage with the higher priced hone-ores.

H.

#### Indiana and her Improvements.

The State of Indiana is so little known at the east, and so seldom spoken of in the eastern journals, that the inhabitants say, and with great propriety, that when any person, other than a resident of the State, speaks or writes of the improvements and resources of the west, they make but one stride from Ohio to Illinois or Missouri, and step entirely over the State of Indiana.

Why this should be the case is more than I can understand, for Indiana is at least worthy of notice, even did she not possess within herself resources rapidly developing, that will ere long place her among the first of the internal improvement and manufacturing States.

She is making long and rapid strides in manufactures and agriculture, independent of her railroads and canals; and these are advancing with a rapidity that will, I think, astonish even the "go ahead" people of the east. In a short visit recently made to Indianapolis, I was so much surprised at the progress her railroads are making, that I was lead to make some enquiries, and I forward you the results of them, which, should you consider worthy of notice, you will please give a place in your Journal.

The Madison and Indianapolis railroad comes first, as it was the pioneer. The great success of this road has done much towards bringing about the results which we now witness. This road, running from Madison, on the Ohio river, to Indianapolis, the capital of the State, a distance of 86 miles, has been in operation for many years. It was originally laid with a strap rail, which is now giving place to a heavy H rail of 60 lbs. to the yard. 56 miles of the entire distance are already relaid, and the remainder is fast being completed, and the road is one of the best paying roads in the Union.

2d. The Shelbyville road, running from Edinburg on the Madison road, to Shelbyville a distance of 16 miles, is also completed with a strap rail 2 1-2 x 7-8, and is in successful operation.

3d. The Rushville road, branching from the Shelbyville road at the latter place and running to Rushville, a distance of 21 miles is entirely graded and is fast receiving its superstructure and iron, the

latter being a strap rail 2-12x7-8.

4th. The Knightstown road, also branching from the Shelbyville road at Shelbyville, and running to Knightstown, 25 miles, is far advanced towards completion, and is likewise receiving its iron, a strap rail 2 1-2x7-8.

5th. The Columbus and Bloomington road, which branches from the Madison road at Columbus, and is designed to run to Bloomington, 37 miles west, where it enters the great coal basin of Indiana. A charter for this road is obtained and a sufficient amount subscribed and guaranteed to insure its completion.

6th. The Jeffersonville road commencing at Jeffersonville, on the Ohio river, opposite Louisville, and running north 66 miles to Columbus, where it intersects the Madison road, is far advanced towards completion, and the company are now receiving their iron, a heavy H rail weighing fifty pounds per yard.

7th. The Franklin and Martinsville road, running from the Madison road at the former place, 27 miles west to the latter, is located, and one half is to be let to contractors next month.

8th. The Lawrenceburg and Greensburg road, running from the Ohio river at Lawrenceburg northerly to Greensburg, a distance of 42 miles, is at present under contraction. This road will ultimately be extended about 30 miles from the latter place to intersect the Madison and Indianapolis road between Franklin and Edinburg.

9th. The New Albany road runs from New Albany, on the Ohio river, 4 miles below Jeffersonville and nearly opposite Louisville, to Salem, 35 miles, thence to Bedford, Bloomington, Gosport and Crawfordsville, 120 miles further, where it will intersect the Lafayette and Crawfordsville road. The New Albany road is located and under construction to Bedford, 65 miles, and iron delivered at present to lay 18 miles. This road will be in operation to Salem next spring, and to Bedford next fall or winter.

10th. The Lafayette and Crawfordsville, running from the terminus of the New Albany road at the latter place to the Wabash river at the former place, a distance of 28 miles, is nearly graded and will probably be finished next season.

11th. The Evansville road, commencing at Evansville on the Ohio river, and running to Princeton, 28 miles, is now being located. From Princeton it will probably be extended 28 miles to Vincennes, and from the latter place it will either run to Terre Haute, 65 miles, or direct across to Indianapolis, about 110 miles, and will in all probability as the country becomes settled, diverge at Vincennes and run to both places.

12th. The Terre Haute and Richmond railroad, commencing at Terre Haute on the state line of Illinois, runs from thence to Indianapolis, 73 miles, and from there 73 miles to Richmond on the Ohio state line. The first division of this road from Terre Haute to Indianapolis is entirely located and under construction, and is to be laid with a heavy rail of 60 lbs. to the yard. The second division from Indianapolis to Richmond, will probably be abandoned and the road diverted from Indianapolis direct to Rushville, and thence across to Cincinnati, via Hamilton, 110 miles, or from Indianapolis to Greensburg, and thence Lawrenceburg and Cincinnati, the distance in either case being about the same.

13th. The Indianapolis and Lafayette road, running from the former to the latter place on the Ohio and Erie Canal and the Wabash river, a distance



of 69 miles, is now being constructed, and will be in operation some time next year. It is to be laid with a heavy rail. Upon its completion to Lafayette, it will be extended north to Michigan City, a distance of 90 miles, there to connect with the New Buffalo and Chicago road.

14th. The Indianapolis and Peru road running from the former city to the Ohio and Erie Canal at the latter place, a distance of 76 miles to be laid with a strap rail 2 1-2x7-8 is now building, and some portion of it will be in operation next year.

15th. The Indianapolis and Bellefontaine road, passing through Pendleton, Anderson, Muncie and Winchester, to the Ohio State line, a distance of 83 miles, is now constructing, to be laid with a heavy rail.

At the State line it will connect with the road of the Bellefontaine and Indiana company, and thence by their road to, and crossing the Cincinnati and Sandusky city road at Bellefontaine, will extend to Gallion, Ohio, where it will intersect the Cleveland and Columbus road, and connect with the Pennsylvania and Ohio road to Pittsburgh.

16th. The Michigan and Ohio road to run from Logansport on the Ohio and Erie canal to Anderson on the Indianapolis and Bellefontaine road; and thence to Newcastle and Knightstown, a distance of about 95 miles, is now about being surveyed—a sufficient amount being subscribed to justify its commencement. At Knightstown it will connect with the Knightstown and Shelbyville road; and thence by that and the Shelbyville road will connect with the Madison road at Edinburg—thus giving another connection between the Wabash valley and the Ohio river. This road will also probably be extended from Knightstown direct to Cincinnati.

17th. A road to run from Fort Wayne on the Ohio and Erie canal, to Muncie on the Indianapolis and Bellefontaine road, about 70 miles, is also under consideration. A charter has been obtained, and, I understand, that the preliminary steps are about being taken to urge it forward.

18th. The Michigan Southern railroad. It is proposed to change the original line of this road, after reaching Cold Water in Michigan, by making a detour south from this point, and running through the northern counties of Indiana to the south shore of the Lake. The length of this line in this State cannot be less than one hundred miles. The route has been surveyed, and there is every prospect that the work will be soon commenced. When constructed it will form the most direct line of railway between the south shore of Lake Erie and Chicago.

In addition to her railways, Indiana has also a long line of canal navigation, to wit:

The "Ohio and Erie canal," 100 miles longer than the great Erie canal in New York, and the "White water canal." The former runs from Toledo on Lake Erie, to Evansville on the Ohio river traversing the entire length of the State. It is already in operation from Toledo to Terre Haute on the Wabash, and is under construction, to be completed in two years from the last named place to Evansville. This canal traverses for a long distance the fertile valley of the Wabash; and cannot fail, from the character of the country through which it passes, to be one of the best paying canals in the Union.

The "White Water canal," running from Hagarstown in Indiana, through Cambridge, Connorsville, Brookville and Harrison to Cincinnati, with a branch to Lawrenceburg, is already in successful operation—comprising, with its branch, a distance

of about 86 miles. This improvement will probably soon be extended, by means of a railroad, to some point on the Ohio and Erie canal, at or near Fort Wayne, a distance of about 85 miles.

Truly the State of Indiana is getting on rapidly. Her present prosperity is a wholesome one, and I do not fear a repetition of the financial disasters that some few years since overtook her. The enormous amount of railways at present in course of construction and completed—comprising an extent of over 1300 miles—may well astonish a person not familiar with the resources of the State.

But when we consider that Indiana was admitted into the Union as late as 1816, and that she now contains a population of one million, we may cease to wonder.

Her immense coal and iron deposits are also just coming into notice, and are rapidly building up a trade, which will in a short time rival that of almost any other State.

Cotton manufactories are also springing up in various quarters, upon a large scale—caused by the cheapness and abundance of fuel, and the proximity of this fuel to the cotton plantations of the south. The people of the west and south—planters, capitalists and consumers—have at length discovered that it is cheaper to carry the cotton to the coal and provisions, where they are in such close proximity, and with cheap and ready means of communication, than it is to carry both cotton and provisions to an eastern water power, or an English coal field, and then to bring it back again, as manufactured articles, to be sold on the very ground upon which it was raised.

The capital of Indiana, now a flourishing city of some 8000 inhabitants, and increasing 25 per cent. per annum, in 1821 was a wilderness. This might also be said of the whole State. The forests are disappearing rapidly before the axe of the eastern emigrant; and in their places spring up, as if by magic, fields of grain, that need but be seen to convince the most sceptical that the soil of Indiana is one of the best for agricultural purposes that we have in the Union.

The hardy and energetic population of this State have in them that indomitable perseverance and enterprise of a down-east Yankee that overcomes all obstacles; and the next thing with them, after the timber is cut from the ground, is a railroad to carry the production of this ground to a market, for they appear to be fully impressed with the idea that a market will not come to them.

One great secret of the construction of so large an amount of railway in a new State, is the cheapness with which they can be built. I have been surprised to learn the light cost of roads in this State, and I think I may with safety state that all the new roads now being constructed will not cost on the average \$2,000 per mile to grade and bridge them. Some of them cost as low as \$1,300 per mile, for their entire length.

The nature of the country, also, is such, with its long and gentle undulating swells, that easy grades and curvatures can be adopted, and they can consequently be worked very cheaply. The great abundance and cheapness of timber for the superstructure and repairs of the track, and of fuel for the engines is also of great assistance towards the cheap working of the roads.

The grading of the roads is, much of it, done by the people, through whose land it runs, and pay taken in stock. The timber is furnished by farmers along the line, and pay taken in stock, in fact everything, except the machinery and iron, is made

or done in the State; and we may ere long expect to see even the machinery and iron manufactured by her own citizens and in their own State.

Is not Indiana a splendid specimen of the enterprise of the American people? In 1820 a wilderness! In 1850 with 1,000,000 inhabitants, 1800 miles of railway and 500 miles of canals.

Thirty years only to accomplish all this! What may we not expect of her in the next 30 years?

Ere three years have passed away, Indiana will make herself known to the world, if by no other means, by the whistle of her locomotives. R.

#### Exports of Great Britain.

We find the following in a letter written from London to the National Intelligencer, dated October 18th:

"A lately published Parliamentary document presents the following facts: The total declared value of British and Irish produce and manufactures exported from the United Kingdom to various countries, was, in 1847, £58,812,277; in 1848, £52,849,448.

	1847.	1848.
The British colonies took.....	£14,588,397	£12,654,183
The United States took.....	10,974,161	9,584,909
The Hanseatic towns.....	6,007,365	4,669,250
Holland.....	3,017,423	2,823,288
France.....	2,554,283	1,024,521
Russia.....	1,844,543	1,622,226
Turkey.....	2,576,989	2,858,179
China, Hong Kong..	1,503,369	1,445,059
Brazil.....	2,568,804	2,067,302
Mexico, and Central and South America (except Brazil)....	2,505,855	3,761,743
Foreign West Indies..	1,410,221	1,018,138
All other countries...	9,290,360	9,024,789
	£58,842,377	£52,849,448

One striking fact developed by this statement is, that next to her own colonies, the United States is the best customer Great Britain has; taking more than one-sixth of her whole amount of exports, and more than any one of her next best customers!"

From the same document we have the following statement of the exports of Pig Iron from Great Britain to foreign countries, during the year 1848:

To the United States.....91,704 tons.  
To other countries.....82,946 "

The total exports of Bar Iron during the same period, were:

To the United States.....162,057 tons.  
To other countries.....159,077 "

From which it appears that Great Britain ships more iron to the United States than she does to all the rest of the world put together!

In this connection, we copy from Bicknell's Reporter the following statement of the amount of bread stuffs sent from this country to England, for the years 1848-9:

The aggregate exportation of breadstuffs from the United States to Great Britain and Ireland, up to the latest dates this year, compared with the corresponding period last year has been as annexed—

To latest dates.	1848.	1849.	Dec'r 1849.
Flour bbls.....	320,513	83,491	237,037
Corn meal, bbls.	18,778	960	17,818
Wheat, bushels.	479,501	163,588	315,913
Indian corn, bu.	2,918,454	422,077	2,496,377

The following is the value of the grain exported to great Britain according to the statement from Bicknell's Reporter, to the latest period in 1849:

83,491 bbls. Flour at \$5.....	\$417,455
960 bbls. Corn Meal, \$3 50.....	3,360
163,588 bush. Wheat, \$1 05.....	171,767
422,017 bush. Corn, 60c.....	253,246

Value of produce exported to England and Ireland.....\$845,828

The New York Journal of Commerce gives the following statement of iron imported into the port

of New York alone, for the 6 months ending Sept. 1, 1849, from Great Britain:

Fm. Eng.	Tons.	
Common bar iron,.....	10,644	aver cost £5,16 11
Pig iron.....	39,972	" 2 11 6
R.R. iron.....	33,878	" 5 16 0
Refined iron in bars.....	15,080	" 7 2 6
Hoop, band, and sheet.	6,396	" 7 17 6

Cost of English iron in New York. \$3,678,094 58

Tons.	
Sweeds iron.....	5,105 aver cost, \$74 75
Russia iron.....	152 " 85 00
Norway iron.....	839 " 98 70

Cost in New York..... 477,886 00  
Total value in New York..... \$4,155,480 58

#### Cheap Railways.

The prices paid for land and the expenses of Parliamentary campaigns, have also told materially against railways in existence. Land, on the average, sells to railway companies for about triple its value. Landowners, therefore, not only benefit largely by the construction of railways, by having a better means of communication, but they exact enormous sums for their land. In America, landowners, instead of being paid for their land, are compelled to make compensation to the companies, in cases where it is ascertained railways have benefited their property. This is, in reality, but an equitable procedure, and contrasts strongly with the treatment which the railway companies of this country receive at the hands of landowners. The expense of passing a bill for a railway through Parliament is equally monstrous. But the legitimate expense of a bill is not so much; it is but trifling, compared with that generally incurred. Opposition is the great cause of expense. There probably never was a bill passed without having to encounter great opposition, because there probably never was a bill for a railway prosecuted in quiet ordinary times. There must be, it would seem, a mania to bring forth railways; and then all the world comes out with railway schemes. It is opposition which engenders expense; and a mania is the hotbed for the raising of opposition. One of our railway companies had to fight so hard for their bill, that they found, when at length they reached the last stage, namely, that of receiving the royal assent, that their Parliamentary expenses had mounted up to half a million of money. Half a million of money spent in barely acquiring from Parliament the right of making a line of railway which is to confer a benefit on the nation! Such is the fact. Without opposition, the same bill would have been passed into an act at a cost not worth naming by the side of that enormous sum spent. It would appear, then, that if local parties, landowners, and others, would unite to form a railway, bringing their knowledge of the features of the country to bear, claiming only a reasonable price for their land, and fostering no opposition in Parliament, that such a work might be constructed much more cheaply than under the present system, since the principal causes of extravagant expenditure would be avoided. They would, by this means, most materially cheapen a railway formed of the levels of a line of the present day and worked by locomotives. But, suppose we use cheaper materials. Suppose we substitute horse power for locomotive, and have cheaper rails, and less expensive carriages, &c.—Suppose we do not care to obtain such perfect gradients, or wish to waste talent and money in such beautiful ornamental structure as our great lines of railway can boast possessing. Suppose landowners unite to form a branch railway from their towns and villages, serving their farms and houses, which shall be worked by horse power or light locomotives—not attempting those fearfully heavy works of making long tunnels, levelling mountains, and raising valleys, turning the course of waters, and changing the face of nature, indulging not in buildings which for luxuriance of style rival the Royal Exchange or our new House of Parliament; suppose they do this, is it not possible to make railways to villages, to places where otherwise there can be none; railways which shall give as much accom-

modation as the traffic needs, and which, giving this accommodation, shall pay a good dividend on the capital expended in their construction?—*Herald's Journal.*

#### From the London Artizan.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

*An Essay on the Comparative Merits of Iron and Wood for Ship-building. By Edwin O. Tregelles, C. E.*

The subject of building iron vessels is one that may well claim the attention of all who are interested in the prosperity of Great Britain. Success in this branch of our industry may be regarded as one of the means by which we may avert the consequences of the alterations in our navigation laws, dreaded by many as calamitous, and by which we may maintain that pre-eminence in the commercial world that has been so long enjoyed. It is probable that Great Britain cannot compete with many other portions of the globe in the construction of low priced wooden vessels, and that, ere long, our shipwrights' yards will be merely places for repairing damaged vessels rather than for building new ones; whereas, if we bend our energies to the successful application of iron for the purposes of ship building, it is probable that we should command the market in ship building, and possess a commercial fleet of the highest order.

Let us assume that there are no prejudices to overcome, and no objections, real or imaginary, to be removed, and coolly consider the relative benefits that accrue from the employment of the respective materials. We will consider the advantages to the state of using the one or the other.

In the building of a first class oak ship of 500 tons, we shall require about 700 of timber in the rough; that timber occupied about 12 acres of land on an average 75 years, and is worth more than £1,200 as it stands growing, before any labor of an artizan has been bestowed on it; or in other words £1,200 is the value of the raw material before it is manufactured, and the hull, when finished for launching, will be worth £6,000, the value of the raw material being one-fifth, or £1,200, and of labor and profits four-fifths, or £4,800. The value of the raw material for an iron ship of the same size would be about £50, being the royalty paid to the owner of the soil for the liberty to work the iron ore, limestone and coal; the labor and profit would be nearly £6,000, say £5,950, and we shall then have an iron ship costing £6,000, of which the raw material cost less than a half per cent. Some persons may estimate the value of iron and oak vessels at less or at more than the foregoing figures, which may not be the exact value of the respective classes, but they are sufficiently near the truth to exemplify the real facts.

We have, then a vessel of 500 tons costing £6,000, whether of wood or iron, but the oak vessel would not last, on the average, more than 15 years, and would require to be repaired in that time probably five times, at an expense of say £300 each time, or a total of £1,500. This may be regarded as a very moderate computation, but it would increase the cost of the oak ship to £7,500, which, if sold for old timber, at the end would fetch £250—leaving £7,250 to be divided over 15 years, and we shall have £473 as the annual cost of the oak ship of 500 tons, exclusive of interest or capital. We will compare this with the iron vessel of the same size, costing £6,000, which, on the average, may be fairly estimated to last 20 years, and may require in that time to be repaired 10 times, at an expense of £100 each time, making the first cost and repairs £7,000. The value of the old iron ship at the end of 20 years may be estimated at £600, giving us £6,400 to be divided by 20 years, and we shall have £320 as the annual cost of an iron vessel of 500 tons, exclusive of interest or capital.—Therefore we see that the cost to this country of using oak vessels may be expressed by the figure 473, and the cost of using iron vessels by the figure 320; or, if we allow for errors in the attempt to form an accurate approximation, we have still a great advantage in favor of iron if we place that figure at 3, and express the oak vessel by 4.

But an iron vessel of 500 tons register would carry 100 tons more than the oak vessel with the same displacement. Nor is this all; the speed of the iron vessel should be much greater, and will run 6

miles while the oak goes 54, or doing as much in 11 months as the oak does in 12, or earning £12 while the oak vessel earns £11. Again, in the time occupied in repairs, the iron ship would not be detained two weeks in the year on the average; whereas one month in each year must be allowed for the aggregate repairs of an oak ship, or 15 months out of the whole time, the money value of which is about £600, while the loss of time by the iron vessel would be only 40 weeks or 10 months, the loss of time being equal to £266. We have an advantage then, of one-sixth as to stowage, and one-twelfth as to speed, making a saving of one-fourth on 30s., or reducing the cost of carrying by an iron vessel to 22s. 6d. (irrespective, of course, of the wages and victualling, which would be alike in each case,) compared with 40s., the cost of carrying by an oak vessel. Besides this, we must estimate the saving in time for repairs, which we see is as £266 for iron, compared with £600 as the value of the time consumed in delay while repairing the oak vessel.—Then if we can carry for 22s. 6d. what has heretofore cost us 40s., would not the adoption of iron vessels keep for us the advantageous position in commerce which we have long enjoyed?

But it may be argued that the premises are unsound, and therefore the conclusions are false; that an iron vessel cannot be as safe as an oak one, and therefore never can succeed; in fact, after all, "there is nothing like oak." Well, let us examine the subject in all the bearings within our reach, and perhaps we shall conclude that, after all, "there is nothing like iron!" We shall find some practical remarks on the subject, in a work by John Grant-ham, a Liverpool Ship-builder. He says—"What are the objects most desired by the merchant in the choice of a ship? These I consider are—

- "1st. Strength combined with lightness.
- "2nd. Great capacity for storage.
- "3rd. Safety.
- "4th. Speed.
- "5th. Durability.
- "6th. Economy in repairs.
- "7th. Cost.
- "8th. Draught of water.

"I trust I shall be enabled to prove that iron vessels possess advantages under all these heads in so eminent a degree as to render them superior to wooden vessels, and address myself to each point in its respective order.

"First, strength combined with lightness. This subject involves two considerations, the strength of the materials, and the mode of uniting them. The great strength of malleable iron to resist strains in every direction is well known, but to those who are not conversant with the subject, the extent to which this advantage may be carried is not at first apparent, nor how the material may from comparatively small pieces be so combined in large masses as to form the ponderous body of a ship; and they are thus too apt to prescribe a limit to its use. An opinion indeed is now very generally entertained, that iron may be suitable for small craft, but is inadequate for the construction of vessels of heavy burthen; this however, is a supposition so erroneous, that the reverse would be much more correct, for large vessels will afford the best practical demonstration of the superiority of iron for ship-building.

In the application of timber, obstructions increase in a ratio proportioned to the increased size of the vessel to be built. How often has the ship-builder the greatest difficulty in obtaining timber to suit the varied curves of our finest ships? How often is the country despoiled of its noblest ornaments, by the tempting prices he is compelled to offer for its most magnificent oaks, the largest of which are frequently insufficient for his purpose! How are his brains racked, and his patience tired, in seeking for crooked timber necessary to frame a sharp floor, or a square bilge! How often is he obliged, though he knows it to be injurious, to scarf the frames for which no timber can be found sufficiently large to enable him to avoid such defects! And is this not one cause amongst others, why our building yards are empty, while our ports are filled with ships from other nations in which timber is more plentiful, and the choice more extensive? But how stands the case when we turn to iron? Where is the frame even of the most intricate form, that our smiths cannot mould? Where the frame or beam so large, that iron cannot be found of which to fashion it, and that too, if need be, without a scarf? Here there



are no knots, no sap, no cutting across the grain; here there is no useless timber, placed merely to fill in, or cross butts. Here every inch of material is of service, and every scrap applied to some useful end. Iron has also to a high degree, the power of resisting compression—timber, it is admitted, has great power to resist tension in the direction of the grain—but it is very deficient in strength across the grain and its power to resist compression is also very limited, especially when exposed to any moisture. Again: timber after being some time in use, becomes brittle, and is but little disposed to bend. Good malleable iron, on the contrary, may be bent double even when cold, and does not become brittle with age, except when converted into an oxid. The ease with which iron beams and frames can be wrought, and the facility of obtaining them of any dimensions in one piece, overcomes one of the greatest difficulties in shipbuilding. I have before stated that the power to increase the stiffness of the hull when built of iron, is unlimited; and provided the shell has originally been made sufficiently thick, additional strength may at any time be given to the frame. The objections arising from the use of fastenings, of a material so totally different from that of which the hull is composed, are entirely removed in iron vessels. In the first place, the outer shell of the vessel is so composed of a series of plates, so rivetted together that its strength is nearly equal to what it would be were it possible to form the whole of one plate. This shell is independent of all indirect means for preserving its completeness. It forms one grand whole of the same material throughout, and that of the strongest kind. This shell is stiffened as before described, by ribs crossing the joints of the plates at short distances apart, and giving an additional security. Beams, knees, bulkheads, all are brought together in one firm mass, and united by numberless, short, unyielding rivets. I may venture, indeed, to say that more real serviceable fastening is often employed in the space of a few inches in an iron vessel than is in most instances brought to bear on one entire beam of a timber-built ship." *The Royal George*, one of the iron steamers running between Liverpool and Glasgow—a vessel of unusual length in proportion to her beam—when loaded with about 150 tons of dead weight, besides her engines and coals, got on a rock near Greenock, at high water, and was left there during a tide without sustaining any injury. She rested nearly on her centre, and all who saw her were of opinion that no timber vessel could have remained in that position without breaking her back. Captain Chaplin, who has had upwards of twenty years' experience in steam navigation, and who was for some time manager of Woodside Ferry, in the course of some remarks on the strength of iron vessels, says, "I may give you a case in point. *The Cleveland*, built by you, got ashore amongst the rocks in the ebb tide, where she was left high and dry for seven hours, hanging entirely by heel and forefoot, without sustaining injury either in the hull or engine."

To be continued.

From the New Orleans Delta.

#### THE CAUSE OF THE EXPLOSION OF THE LOUISIANA.

We devoted a good part of yesterday to an investigation into the causes of the late disastrous explosion of the boilers of the Louisiana. We were induced to make this investigation by an apprehension of the dilatory and uncertain character of any legal investigations, and by the deep interest and anxiety which pervade our community on this subject. A very intelligent, scientific and experienced engineer, who has been engaged in the profession for twenty-three years, Mr. W. F. Mix, kindly volunteered to aid us in our investigations. We proceeded to the corner of Canal and Front streets to examine the fragments of boilers lying there. Mr. Mix explained the position of the boilers, and showed that when there was no water in them, or not sufficient water, the lead around the chocks would melt. These chocks are the connecting links between the boilers, they are within the furnace, on the forward end of the boilers, and the lead by which they are joined, lies close to the exterior surface of the boilers, which, when filled with water, never acquires sufficient heat to melt the lead. Mr. Mix then showed that the lead of the chocks now lying on the levee, was melted, and

consequently that the boilers did not contain sufficient water. The origin of the catastrophe was thus simply and satisfactorily explained. But Mr. Mix went further, and explained to us the probable cause of the deficiency of water. The boat lay touching the bottom of the river, a fact admitted by Captain Cannon. The pumps being set to work, probably heaved mud instead of water, and the engineer did not possess skill or experience enough to discover or correct his error. Mr. Mix introduced us to Mr. William Smith, engineer of the Silas Wright, who informed us that on the next day after the explosion of the Louisiana, he went aboard the General Jessup, lying near the site of the Louisiana, when the engineer of the Jessup just as he was getting up steam, discovered that his doctor was out of order, and that the pumps heaved mud instead of water. The engineer, as soon as he perceived the difficulty, immediately put out his fires and cleaned out his pump valves, and thereby avoided the catastrophe which the ignorance or negligence of the engineer of the Louisiana brought upon that ill-fated boat.

These facts, this simple explanation, afford a full solution of the origin of this awful calamity.—The second engineer of the Louisiana, who was on duty in the absence on leave of the first engineer, was ignorant of his duties, or grossly neglectful of them. We learn further that the doctor of the Louisiana had been out of order, and they had been working at it all the day. The case is one of gross, palpable and inexcusable ignorance, the consequences of which must attach to all who are implicated in employing so incompetent a person in so responsible a trust.

On the other hand, we were yesterday waited on by Mr. Robert Robinson, a young man who has been employed as an assistant engineer. He is the person referred to by us yesterday, as having remarked, "it was coming," and then left the boat. Mr. Robinson says he was aboard of the Louisiana three minutes before the explosion; he went aboard to see Clinton Smith, the second engineer, who was a friend of his. Whilst in the engine room, he saw Smith raise the mud valve and blow it, and that at the request of Smith, he (Robinson) tried the upper gauge cock of the starboard boiler, and perceived that there was water in it; Smith tried the others, and said they would do. He also noticed, from the leads, that there were forty pounds less steam than he has frequently seen the boilers bear.—While he was standing in the engine room with Clinton Smith, he says the Captain's brother came up and told Smith to get her hot. At this time, the boat was listed to the starboard side about three inches. Robinson then left, and was standing on the board, conversing with Mr. Alfred Watson, the pilot of the Louisiana, when he heard Smith ring his ready-bell at the starboard engine. Whilst conversing with the pilot, the explosion took place, and half of the boiler head struck Mr. Watson, within a few steps of him (Robinson) and killed him instantly. Mr. Robinson says there were three successive reports, as of different explosion. The boiler, the fragment of which was thrown to the corner of Canal and Front streets, was that next to the larboard, and had been taken out of the old Memphis.

Our readers will determine for themselves what weight should be attached to these conflicting statements. We are satisfied that there are not sufficient water in the boiler, and that the disaster occurred from the gross ignorance or negligence of Clinton Smith, the engineer. There are persons who believe that Smith escaped, but slightly hurt; but we have as yet been unable to discover any facts which would change our first impression that he perished in the explosion, one of the first victims of his own neglect and incompetency.

#### Alabama.

The prospect of the speedy completion of the Georgia South Western road to the Chattahoochee, has aroused the attention of the people of South and Eastern Alabama to the extension of this line to Pensacola or Mobile. We see by the Alabama papers that the preliminary steps for the accomplishment of this object are now being made, and when we take into consideration the importance of this link, not only to those living on its line, but to the

railroads of Georgia and South Carolina, and the commerce of the whole country, we cannot doubt its early completion. We dwell upon this subject somewhat at length in our paper of the 17th ult.

The Mobile planter gives the following notice of the steps now being taken in reference to this object:

#### GIRARD AND MOBILE RAILROAD.

A meeting of the citizens of Macon county was held at Enon on the 14th inst., to adopt measures for building a railroad from Girard to Mobile Bay. Among other resolutions, one was adopted proposing to hold a mass railroad meeting at the Chunne-nuggee Camp ground on the 13th December; and also for the appointment of a committee to solicit subscriptions and correspond with gentlemen in the several cities interested in the construction of said road.

Another meeting for the same object was held at Eufaula on the 16th inst. Resolutions were adopted for the appointment of four delegates to Mill-Edgeville to memorialize the Legislature of Georgia on the subject of the southwestern railroad, and to procure, if possible, the construction of a branch to the town of Eufaula; also 20 delegates were directed to attend the railroad convention to be held at Montgomery on the 4th of Dec. and authorising said delegates to memorialize the legislature on the subject of connecting Eufaula by railroad with the Gulf of Mexico at Mobile or Pensacola, and to petition that body for a charter.

We have the following letter on this interesting subject:

Columbus, Ga., Nov. 16, 1849.

Dear Sirs—I beg to call your attention as lovers of useful enterprise, to an article in the last "Times" on the Girard and Mobile railroad project. I assure you that the picture there drawn of the spirit of the movement here and along the line is not over-colored. It takes like wildfire, and I have strong hopes of being able to report authentically, in a short time, that 60 miles of grading, and a part of the superstructure, have been engaged to be done by individuals for stock. Mark the fruits of the enterprise. It puts you less than four and N. Orleans four and a half days from New York.

New Orleans to Mobile,	18 hours.
Mobile to Columbus	12 "
Columbus to Macon	4 "
Macon to Savannah	11 "
Savannah to N. York	60 "
	—
	105

The following is the article alluded to above:

*Mobile and Girard Railroad.*—The work goes bravely on—the spirit of this great enterprise, which has for years past been struggling into shape, appears at last to have leaped forth at a single bound, a full grown and matured project. We have never known any enterprise to be taken hold of with so much spirit, and so to take like wildfire along the whole route of its promulgation. The route is now being traversed by an enterprising gentleman of Russell county, with a view to spread the flame along the whole line, and interest the people living on it in its behalf. So far as heard from, every body appears eager to lend a helping hand. We refer to the proceedings of the railroad meeting below.

A mass railroad convention is proposed to be held at Chunneumuggee, which will be no doubt well attended, and productive of good results. We invoke the aid of our brethren in New Orleans and Mobile to awaken a proper enthusiasm at the other end of the line. The prize is a splendid one.—It is a project to put New York and New Orleans four days and a half travel from each other.

#### MINNESOTA.

We copy the following interesting particulars relative to this hitherto unknown territory from the St. Louis Republican.

Minnesota Territory is bounded on the north by the 49th degree of latitude which divides it from the British Possessions, on the east by Lake Superior and Wisconsin, on the South by the State of Iowa, and on the west by the Missouri river and the Ore-

gon territory, from which it is divided by the Chipewya mountains. The river St. Croix, already famous for its rapids, its pine forests and lumber business, is the boundary from Wisconsin on the South east.

Minnesota is the aboriginal name for the St. Peter's river, and means the Turbid waters; Minne being water in the language of the N'Decotahs and Soto, turbid or muddy.

The Territory contains an area of 166,000 square miles, with as large an amount of arable land, fit for immediate cultivation, as in most of the States, in proportion to its extent. Four or five large States may yet be carved out of this immense territory.—In the south eastern section are immense pine forests, and directly in their midst the most abundant water power for the manufacture of lumber, or in future, every article of human comfort. Commencing about twenty five miles above the mouth of the St. Peters, is a vast forest of hard wood timber extending more than a 100 miles along the river, and from twenty five to forty five miles wide.—And judging from the history of all our new States on the Mississippi, as the country becomes explored and settled, a much larger proportion of timber will be found to exist than is at first supposed.

In the organic law of the Territory, provision was made for a Legislative Assembly, to consist of a Council and House of Representatives. The Council at present consists of nine members, elected for two years, and the House of Representatives of eighteen members, elected annually. The number of each may be increased by the Territorial Legislature, as population increases, but not to exceed fifteen Councillors and thirty nine Representatives.

By proclamation of the Governor, our election for members of the Legislature and Delegates to Congress was on the 1st of August, and the first Legislature of the Territory commenced its session in a house provided for the purpose in the town of St. Paul, corner of St. Anthony and Minnesota streets, on the first Monday in September. It continued in session nearly two months.

The Honorable H. H. Sibley is the Delegate to Congress.

#### Public Debt of Pennsylvania.

The following is an exhibit of the debt of this State, and of the several acts by which they were created:

Loan per act of April	2	1821	\$26,951 89	
" " April	1	1826	295,461 15	
" " April	9	1827	999,311 15	
" " March	24	1828	1,998,407 09	
" " Decem	18	1828	798,474 64	
" " April	22	1829	2,197,849 55	
" " Decem.	7	1829	50,000 00	
" " March	13	1830	2,993,305 47	
" " March	21	1831	2,481,711 83	
" " March	30	1831	209,096 49	
" " March	30	1832	2,348,777 64	
" " April	15	1832	300,000 00	
" " Feb.	16	1833	2,540,010 56	
" " March	1	1833	200,000 00	
" " March	27	1833	525,922 74	
" " April	9	1833	120,000 00	
" " April	5	1834	2,265,059 75	
" " April	13	1835	959,540 79	
" " Jan.	26	1839	1,195,928 92	
" " Feb.	9	1839	1,278,375 99	
" " March	16	1839	100,000 00	
" " March	27	1839	460,679 22	
" " June	7	1839	49,998 25	
" " June	27	1839	1,134,332 70	
" " July	19	1839	2,053,933 42	
" " Jan.	23	1840	860,073 13	
" " April	3	1840	860,380 89	
" " June	11	1840	1,039,683 65	
" " Jan.	16	1841	800,500 00	
" " March	4	1841	22,035 06	
Loan (relief)	May	4	1841	752,664 00
Stock loan	May	5	1841	565,875 95
"	May	6	1841	903,048 20
Int. certificates	July	27	1842	44,681 60
"	March	7	1843	83,496 54
Stock loan	April	29	1844	59,551 46
Int certificates	May	31	1844	82,611 38
Stock loan	April	16	1845	4,489,463 79
"	Jan.	22	1847	62,500 00
"	April	11	1848	135,214 00

#### South Carolina.

**Public Debt.**—The following detailed statement of the debt of this State we copy from the late message of the Governor:

Rate of loan.	Interest and date	Am't now owing.	When payable.	Where payable.
6 pr ct. R.R. loan, '39		\$176,328 71	1850	Chas'ton
6 " " " "		176,328 71	1852	Chas'ton
5 " Fire loan, '39		486,666 67	1858	London.
6 " " " "		482,722 20	1860	Chas'ton
5 " " " "		488,888 88	1868	London
6 " " " "		325,808 90	1870	Chas'ton
6 " Randolph Stock,		10,000 00	1850	Chas'ton
5 " Railroad B. Cap.		46,714 34	1859	Chas'ton
3 " Revolutionary,		117,438 40	at pleas.	"

\$2,310,896 81

\* Valued at \$72,810 60.

The resources of the bank, applicable to the payment of this debt, amount to \$3,888,368 60, which is an excess of available assets over the liabilities of the State of \$1,532,843 99, or over two and a half millions, if the sum of \$1,051,000, received from the Federal Government on deposit, be included.

Governor Seabrook recommends an immediate winding up of the affairs of the Bank. The part of the message having reference to this we give as follows:

In 1833, it was deemed "expedient and beneficial both to its citizens and the State, to re-charter the bank." It now becomes the solemn duty of the Legislature to inquire whether its existence shall be prolonged beyond the year '56, to which by law it is limited. On this subject a great diversity of opinion has been for many years entertained. The public mind seems at length to have been brought to the conclusion, that the bank has not accomplished the high purposes for which it was created, that it is a dangerous institution; anti-republican in its character and tendency; and that the evils inevitably arising from the connection between a monied corporation and the State, increase and ramify the longer the rights and privileges of the former are extended. The resolutions of your last session, adopted by very decided majorities, and the apparent acquiescence of the people in the decision of their rulers, would seem to have definitely settled the question of a re-charter, and that necessarily all minor and collateral issues have been absorbed by it.

The political history of South Carolina has too long presented the anomalous spectacle of its constituted authorities pertinaciously upholding a State corporation, while it denounced any union between a bank and the Federal Government. To me it is obvious that, except the unconstitutionality of a United States Bank, and its possession of a wider field of operations, every argument which might be wielded against it, would fall with equal, if not greater force against a State Bank. From Experience moreover we learn, that the establishment of such an institution, possessing the right of substituting a fictitious currency for determining the value of the products of labor, is not easily divested of its established authority. By the influence it insensibly acquires, it measurably perpetuates its own existence. The fatal blow to the Federal Bank was given by the Executive in the exercise of an unwarrantable power. I invoke the legislature, then, to profit by the admonitions which the past has written on the legislative history of our country. I also desire, in this place, to express my settled conviction, that the Bank of the State was founded on a false and pernicious principle; that to grant to the members of a community almost exclusively devoted to rural pursuits, unusual facilities for commanding money, is to inflict upon them and their posterity an unmitigated evil; that the more numerous and difficult the obstacles in the way of receiving bank accommodations by that class, the greater their contentment, and the more certain the success of their vocation. Whenever the agriculturist substitutes speculation for the results of industry, his prospects may seem brilliant for a season, but the day of darkness and disaster will inevitably follow.

In submitting a plan for winding up the bank, I scarcely need assure you, that the subject has re-

ceived my most attentive examination, and that in suggesting the necessity of your action upon it, I have been influenced solely by a high sense of official duty.

It is proper that I should inform you, that Messrs. Baring, Brothers and Co. of London, have addressed to me a communication substantially protesting against closing the Bank, on the ground that that institution was voluntarily offered by the State as one of the securities for the loan negotiated by them. I will only here remark, that it is not proposed to destroy the Bank, but to deprive it of its banking powers. It will continue as a corporation until 1860, four years beyond the period to which its duration extends by the existing law. At that time only \$488,888 88, of the foreign, and \$398,619 50 of the domestic debt will be due, while the assets of the bank will amount to about two and a half millions. But in truth, the foreign debt will then have been paid, if the plan of hypothecating securities, or emitting new bonds, should the ordinary means fail, be resorted to. In order to secure that result the directors should be invested with full powers. By this expedient, the argument of violated faith will have no ground on which to rest. The state will have discharged its obligations in full, and that too before the period specified in the contracts. In the meanwhile let the assets of the banks, not required for the redemption of the liabilities of that institution be solemnly set apart for the liquidation of the public debt.

In conclusion allow me to add that, as far as my personal knowledge extends, the bank from its organization to the present day has been ably and faithfully conducted. My objections are not to its administration, but to the policy in which the institution itself originated.

The accompanying letters from the president and cashire were written in reply to certain interrogatories propounded by me.

#### Reservoir on Beacon Hill, Boston.

This magnificent work is now nearly finished. The water was let in for the first time on Monday last, and is now let in over night, and drained off in the morning. It rises into the basin, through two pipes 24 inches in diameter, one at the south-east and the other at the south-west corner. There is a gate at the south-west corner, by which means the reservoir may be emptied and cleansed; and just under the coping is a waste-weir, to let off the surplus water. The water is to rise to the coping, within 18 inches of the top. The basin is surrounded by a double wall, twelve feet thick. The bottom is laid with a mixture of cement and gravel, called *concrete*, which becomes as hard as a rock, and over this is a pavement of brick.

The structure is about 200 feet on each side, and covers about an acre. The basin measures on the inside about 160 feet square. It is 16 feet deep, and will hold 3,000,000 gallons.—The floor is supported by 14 massive walls, turned with arches running parallel with Derne street, except the short arches at right angles with that direction on the Derne st. side.—The appearance of the immense pile from Derne and Hancock streets, is grand and imposing; and the view from the top [the ascent to which is by a flight of stairs] is very fine. You stand above the tops of the houses, except a few on the top of the hill, and take in at one view East Boston, Chelsea, Charlestown, and East Cambridge, and look down upon the city of Boston below.

This huge fabric contains about 700,000 cubic feet of masonry, weighing not less than 70,000 tons. For six months, 250 tons have been raised per day. It has swallowed up 15,000 cubic yards of granite, and 9,000 of concrete. It does great credit to the architect, and to the enterprising contractors, and will be, for ages to come, to Boston, what those immense hydraulic works, now in ruins, have been to the great cities of the East.

Under this pile are immense rooms for storage which, we sincerely hope, may never be desecrated for storing alcoholic liquors.

The contractors by whom this great work has been constructed, are Messrs. Conder, Case & Co., gentlemen of extensive enterprise and skill, the senior partner being engaged in the construction of various public works, now in progress in Maryland and Pennsylvania. The manner in which their great contract has been performed, reflects the high-



est credit upon their capacity for such undertakings. The difficult work has been accomplished with remarkable quietness and good order, and without the annoyance to citizens which generally attend such works. The contractors have left behind them a good name, and have secured themselves many friends, by their uniform courtesy and gentlemanly bearing.—*Boston Atlas*.

#### Railroad Winter Arrangements.

BUFFALO AND ALBANY.

We learn from the Syracuse Journal of the 28th ult., that a meeting of the Superintendents of the several railroad companies between Albany and Buffalo, was held in that city on Monday last, for the purpose of making the usual arrangements for the winter. After consultation, the following schedule was fully agreed upon. The new arrangement takes effect on the 17th of December. The passenger trains going west will leave Albany as follows:

	Express.	Mail.	Night.
Leave Albany	7 A.M.	10 A.M.	7 P.M.
Schenectady	7 45 "	11 "	8 "
Utica	11 25 "	3 30 P.M.	12 "
Syracuse	2 P.M.	7 "	2 30 A.M.
Auburn	3 15 "	8 45 "	4 30 "
Rochester	6 30 "	2 A.M.	9 "
Arrive at Buffalo	10 "	6 "	1 P.M.

FOR THE EAST AS FOLLOWS—

	Express.	Mail.	Night.
Leave Buffalo	7 A.M.	10 A.M.	7 P.M.
Rochester	10 "	2 30 P.M.	11 15 "
Auburn	1 30 P.M.	7 45 "	4 30 A.M.
Syracuse	3 15 "	9 45 "	7 "
Utica	5 45 "	1 A.M.	10 "
Schenectady	9 "	5 "	1 45 P.M.
Arrive at Albany	9 45 "	8 "	2 30 "

**FREIGHT TRAINS.**—The freight trains will leave east and west as follows:

	Express.	Mail.	Night.
Leave Albany	2 P.M.	7 A.M.	
Schenectady	2 30 "	8 "	
Utica	11 "	1 30 P.M.	
Syracuse	7 A.M.	6 30 "	
Auburn	9 30 "		
Rochester	4 30 P.M.		
Arrive at Buffalo	10 "		
Leave Buffalo	1 "		
Rochester	6 "		
Auburn	1 A.M.		
Syracuse	3 30 "	6 A.M.	
Utica	9 "	10 30 "	
Schenectady	3 P.M.	5 P.M.	
Arrive at Albany	4 "	6 "	

#### Georgia.

**The Savannah and Augusta Railroad.**—The following gentlemen constitute the directorship of this road:

Alex. R. Lawton, President, James P. Scriven, Chas. F. Mills, John Stoddard, Wm. Duncan, of Savannah; John C. Poythress and John Dowse, of Burke.

We copy the following complementary remarks in relation to these gentlemen from the Savannah Republican:

We feel bound to congratulate the subscribers to this Road on the excellent choice of their Directors. We are not acquainted with the Directors from Burke co., but they are spoken of in the highest terms, and there is no doubt that their services will be of great value. Of the Directors belonging to the city of Savannah we can speak to the point and those who know will concede that it would be difficult to organize a better board. Among us certainly, it would not be possible to name five men of better judgment, of sounder discretion—whether in the management of their own business or of any trusts confided to them. Some of them are men of wealth and influence, and others are merchants of deservedly long standing. All are men whose word is as good as their bond, and whose character are the best guaranty of their future course.

The choice of Mr. Lawton for President, is, in

our opinion, a peculiarly happy one, and satisfactory, we are sure, to all concerned. His intelligence, his unconquerable perseverance and energy, his amenity of manners, and his uncompromising integrity, are qualities which render his appointment eminently judicious.

**Lake Champlain and St. Lawrence Railroad.**—An attempt is about to be made to extend this railroad which now leads from La Prairie, opposite to the city of Montreal, to St. Johns, along the St. Johns river to Rouse's Point, where it will unite with the Ogdensburg railroad, near the point where it will cross the outlet of Lake Champlain. The length of the proposed extension is 21 miles.

#### Public Debt of Canada.

The provincial debt is \$20,832,561, which is higher than the liabilities of any State of this Union, Pennsylvania and New York excepted. The public works, which have cost \$18,000,000, will only bring a revenue this year of \$200,000, or a little over one per cent.

**Enormous Increase of the Iron Business in Wales.**—The increase of the iron business is, probably unexampled in the history of the world. The population during the 40 years, from 1801 to 1841, increased in Newport from 1,423 to 13,766 in Trevelin, from 1,742 to 14,942; Aberystwith, from 805 to 41,272; Bedwelty, from 619 to 22,413. This is the progress in Monmouth; in Glamorgan the increase has been, if not in the same enormous proportion, still enormous in itself. Thus, during the same period, the increase at Merthyr has been from 7,705 to 34,977; at Cardiff from 1,870 to 10,077; at Swansea, from 6,831 to 16,787. The progress in the actual trade is shown by the returns to be equally astonishing; in 1820 the iron sent from the works for shipment to Newport, was 45,462 tons; in 1847, 240,637. The quantity at Cardiff, in 1820, was 50,157 tons; in 1847, it was 220,953; and this is exclusive of a quantity of iron shipped from smaller ports, which owe their existence to the last 20 years. We scarcely believe that any other country could show a similar result in any branch of business. The quantity of coal sent in 1846 from the four ports of Cardiff, Swansea, Llanelly, and Newport, amounted to 1,847,318 tons. The value of the shipments of iron alone from the counties of Monmouth, Glamorgan, and Carmarthen, was estimated, in 1847, at four millions sterling.—*Church of England Quarterly Review*.

#### FORWARDING CATTLE BY RAILROAD.

We copy from a Western paper the following interesting letter relative to the facilities offered by railroad for sending cattle to market over the old way of driving.

Sir:—In your remarks respecting my enterprise of shipping cattle from Lafayette. The Toledo Republican has misunderstood my verbal remarks and the errors in both papers will discourage rather than stimulate farmers to carry cattle. When last at the east I made it a great object to ascertain facts at Boston and New York and also from freighters on the lakes and canals. The prices of freight on cattle will be about half of what you have stated.

My estimates are these: Thirty-five head of cattle weighing 1000 lbs., and one hundred hogs will make a full freight from Lafayette to Toledo.

Cost for Cattle by Canal, say \$2 00  
Across the Lake \$2 25  
To New York via Erie Railroad, when finished \$6 00

Should New York State take off the canal tolls which the Buffalo and Erie railroad have to pay, cattle can go to Albany for less than the cost from Dunkirk, to New York; and to Boston for something more. To allow for contingencies, I estimate the cost of taking an ox of 1000 lbs from Lafayette to Boston from \$12 to 15.

The loss on oxen by driving is great say an average of a 150 lbs., equal to \$10 00  
Injury to remainder of carcass, compared with oxen not driven say as much more, \$10 00

It takes from 80 to 90 days to drive cattle from

Wabash to New York. They can be taken from Lafayette to Toledo in five days; to Dunkirk or Buffalo in 2 days and New York or Boston in 2 days; making in all only 9 days.

I intend soon to address the citizens on this and some kindred subjects, deeply interesting to the inhabitants of this valley.

H. L. ELLSWORTH.

#### Growth of Buffalo.

The population of this city at different periods since the year 1810 has been as follows:

In 1810	1,508
In 1820	2,095
In 1830	8,653
In 1840	18,213
In 1845	29,773
In 1848	40,521

The census in January, 1848, was taken by order of the Common Council, by school Districts, to ascertain the number of children; but as it was but slight additional trouble to make the census complete, the whole population of the Districts was enumerated. It was taken when navigation was suspended and most outdoor operations necessarily interrupted, causing a considerable diminution of our population as compared with the spring, summer and fall months. The loss from these causes could not be estimated at less than 1500 to 2000.

The census to be taken during the ensuing year will probably show our population to be about fifty thousand, and rank as the tenth city of the union in point of numbers. If our importance were rated in proportion to our commerce we should probably rank sixth—New York, Philadelphia, New Orleans, Boston, and Baltimore only exceeding us. Before many years, however, we shall leave Baltimore in the rear, and there probably stop, as it is scarcely presumable we can exceed the commerce of New York, Philadelphia, New Orleans, or Boston.

#### Pennsylvania.

**Rails for the York and Cumberland Railroad.**—

We mentioned last week that several vessels had arrived at Baltimore laden with railroad iron for the York and Cumberland road. Part of it has arrived in York, and we are indebted to a gentleman connected with the engineer corps of the road for the following description of the rails, from which it would appear that they are a very superior article:

"They are of the  $\Omega$  pattern, but different from any other of that pattern in this country, being 1-4 inch wider in the head than sides, which at first sight would appear impossible to roll. They are 3 1-2 inches high, 4 1-2 inches width of base, in lengths of 15 and 20 feet, and weigh 62 pounds to the yard. The great advantage of this form of  $\Omega$  rail over any other in use, is that the flanges of the wheels cannot rub the sides."

We are informed that in breaking a rail for an experiment last week, it took sixty-six strokes with a fifteen pound sledge, after cutting an eighth of an inch deep all around the rail to produce the fracture. The quality of iron is of a clear gray color, and high metallic lustre, and competent judges have pronounced it to be very superior. The rails are from the manufactory of Bailey, Bros. & Co. of England.

**An Experiment with Dauphin County Coal.**—A very interesting and important experiment was here, on Saturday, in a locomotive on the railroad, with the semi-bituminous coal of the Dauphin and Susquehanna Company. The fire was regulated by Mr. Kirk Few, the able and experienced superintendent of the Harrisburgh and Mount Joy Railroad Company, accompanied by several gentlemen interested in the application of this fuel for steaming purposes. Although the fire box was constructed for the use of wood, the combustion of the coal was so rapid, and the flame so intense, that steam was generated to an excess that required to be blown off frequently.—The whole trial was completely successful, and Mr. Few expressed his entire satisfaction that it would accomplish all that could be desired for driving locomotives—that it was indeed

the perfection of fuel for this purpose. Even while going up grade, and both pumps supplying water to the boiler, the steam was in such excess as to be required to be blown off. It is gratifying for us to state that the railroad to the mines will be finished in a few weeks, and that an inexhaustible supply awaits the industry of the miner to bring it to market here, which being the centre from which canals and railroads radiate in all directions, will supply a want already felt in the scarcity and dearth of wood.

# AMERICAN RAILROAD JOURNAL.

Saturday, December 8, 1849.

## Is Protection Monopoly?

There are few exchanges which we read with more satisfaction than the Mobile Planter. It always brings to us a large amount of useful real information, and as a general rule takes a broad liberal view of the subject it discusses. The view it takes of the question of protection, however, is an exception to the general good sense displayed in its columns. In the efforts now making at the north to secure additional protection to the great manufacturing interests of the country, it sees nothing but a scheme got up to enrich the few at the expense of the many, and gives us the following as illustrative of the operation of a protective tariff:

"Some people tell us that a protective tariff is good for every one and every species of industry which the country produces. This is an error, and is just as reasonable as the old saying that two Yankees, if placed on a rock in the sea, could each make a fortune by 'swapping jackets.' The thing may be illustrated. If the legislature of this state should pass a law saying that every newspaper beyond the limits of Mobile must pay a duty of one dollar on each number before it could be sold in the city, why of course few would be sold. All the papers here would enhance their prices just up to the point where the citizens would prefer to pay for a Mobile paper instead of a distant one. This, perhaps, would raise our subscriptions to forty or fifty dollars a year.—The reader will see that this would be placing a great burden on the people, and some three offices would reap the benefits of it, to the disadvantage of the whole population. Suppose a similar condition in regard to shoes, which are essential to every one. A man can do without a newspaper, but not without shoes. The result would be the same. The local makers of shoes would enhance their prices three or four times, or just up to a point where a man would rather pay for the home made article than give five hundred per cent. on the cost of that made in New England, or elsewhere beyond the limits of the city. Shoemakers in town would undoubtedly flourish under this system; but the increased cost of their wares, added to the high cost of house rent, would go high to make some people do without shoes, or live in the air beneath the canopy of heaven, where there is no tax.

"This manner of argumentation illustrates the value of a tariff, and shows how impossible it is to make it general in its protective fruits. It must necessarily give bounties to a small class, to the detriment of a great majority; or it must be general, and thus be pernicious to every one. It cannot from the nature of industry be the former, and thus it is everywhere confined to filching from the great industrial masses the dollars which go to fill the pockets of the few."

Let us examine these illustrations and see whether they sustain the conclusions of the editor of the Planter. Well, then, in consequence of a prohibition of foreign newspapers, the Mobile papers advance their subscription price from three to fifty dollars! This extravagant advance is instantly telegraphed to all the surrounding cities, and excites as much commotion among the *fraternity*, as the numerous stories from California do among the restless and adventurous Yankees. In two hours' time, a half a dozen or more printing establishments would be packed up, and on their way to this won-

derful city, where newspapers sell for a dollar a piece; and the next morning after this advance had taken place, would witness the issue of we know not how many Peoples Friends, Anti-monopolists, large-sale-and-small-profit papers, with a subscription list at \$40. The next day the same competition would bring the list down to \$30, the next to \$20, and before a week had elapsed, all would come down to the old regular price of \$3 and go on at this rate as if nothing had happened. Precisely so with the other illustration. Shoemakers from all parts of the country would flock to the place where they could get \$10 for a pair of shoes, and would soon so glut the market, that they could not get for their shoes half their real worth. We ask the Planter whether, if the city of Mobile should prohibit the sale of foreign newspapers and shoes, the subscription price of her newspapers would long remain at \$40 or the price of shoes at \$10, or whether competition attracted by high prices would not bring down the price of these articles to a fair value, so that labor employed in that city in their production, would be no better than labor employed in other departments of industry? If the answer is affirmative, then his illustrations become precisely the ones used by the protectionist, to show that though a protection may cause a temporary rise of prices, competition, which the augmented prices invites, brings down the price of the article protected to as low a point as it can be afforded with a fair profit.

Monopoly we understand to mean, the conferring of certain privileges upon an individual or a class, to the exclusion of other individuals or classes. We never heard of a tariff in this country that did not give the same privileges to all. The exclusion of the foreign article gives the manufacturer of a similar one in this country no monopoly, though it may increase the price of the article for a time, as every other person may go into the same business, if he chooses, as many assuredly will, just so long as the article remains above a fair remunerative price.—Capital is abundant in all parts of the country; and it as naturally follows in the directions where it will yield the greatest return, as water seeks its own level. If manufacturing becomes more profitable than agriculture, capital is diverted from the latter to the former employment. If the reverse is true, capital leaves manufacturing and engages in agriculture. It needs no Solomon to tell us this, or the cause of it. It is a universal experience that men pursue what is, or is believed to be, their highest interests. So certain and unerring is this law, that if, for example, foreign iron was entirely excluded from this country, the iron manufacturer would be in no more favorable condition in a short time than the farmer or cotton planter, as they would turn their attention to the manufacture of iron, if more profitable than their own pursuits, and competition, therefore, would bring down the price of iron, and the withdrawal of labor from farming and cotton growing, would increase the price of agricultural products and cotton. An equilibrium would soon be restored, and just those portions of the community would be engaged in those several branches of industry, so as to secure to all an equal return for their labor. A tariff amounting to exclusion could not operate as a monopoly for the most obvious reasons.

The great manufacturing interests of this country are those of iron, cotton and woolen goods, for the production of which it is as well adapted as any country from which we import these articles. The State of Alabama has water power and coal enough to drive all the machinery in the United States, and iron enough to supply the world. So has Virginia,

Pennsylvania, Ohio, Indiana, Illinois and many other States. A tariff protecting these articles is not local in its effects, and if useful, is just as much for the interest of Alabama and Pennsylvania, as both have precisely the same interest to be promoted.

If protection, therefore, gives the privilege of filching to one it does to all, and if it makes it profitable for one to filch it does for all. Will the Planter tell us how long the whole community can prey upon the remainder, and make money by it? We await an answer.

No paper has more commendable state pride than the Planter, and none insists more strongly upon the importance of Alabama developing her resources, which lie in her vast fields of coal and iron ore. Now suppose that these mines are wrought, and that 200,000 tons of coal and 100,000 tons of ore are raised annually. From the abundance of iron and coal in this State, these cannot be considered as worth more than 25 cents per ton; and consequently would realize to the State only the paltry sum of \$75,000, too small a sum certainly to occupy the attention of a great State like Alabama; a sum not greater than the income of many individuals among us. But suppose that the ore raised is converted by the coal into iron, and that the product is 50,000 tons of bar iron, worth \$60 per ton. By the process of manufacture, this \$75,000 worth of raw material has reached a value of \$6,000,000. How is this additional value made up? One-half of it probably of agricultural products to sustain the labor employed—products which would have been comparatively useless but for the market this opened for them. The remaining value is chiefly made up of labor, which otherwise might have remained comparatively unemployed. When we therefore speak of the vast mineral resources of a State, we scarcely take into consideration the market value of the raw material, but consider them merely a means by which other resources, vastly more extensive, are made valuable. Take for instance England. The market value of the ore and coal in her mines is a mere bagatelle compared with the enormous value of the products which grow out of them.

A water power may be worth but a few hundred dollars, yet when improved it will form a nucleus, around which millions of property will gather.—The great end, therefore in the "development of our resources," is to create a demand for labor and the products of the soil.

Now, protection we have shown does not place the manufacturer in any better position than any other member of a community. It is the farmer that is chiefly benefited, because it creates a market where none existed before. If he pays more for his iron with protection, this gives him better means of payment, because he can procure it by an exchange of articles which have no marketable value abroad. From this new market he certainly receives benefit. The only question is whether it costs him more than it is worth. In answer it may be said, he certainly pays only what the article costs. If it can be profitably manufactured without protection, a high tariff does not add to its price.—All that a tariff can do is to give a manufacturer a fair remuneration for his labor, which he could not obtain without it. It may compel us to pay a higher price for articles protected, but a greater part of this increased value goes to the farmer, who contributes more largely than any one else to the elements of value.

In what we have said, we have merely stated the negative side of the argument. We think we have



shown that the objections urged by the Planter exist only in its imagination, and that its illustration is fatal to its argument. We reserve the affirmative for another number of our paper.

#### India Rubber Springs.

India rubber springs for railway cars are rapidly gaining in favor, or we may rather say that their superiority over all others is now fully admitted, and their use is becoming almost universal. Of the general adaptation of this article to this purpose, most people were willing to admit. The great fear was, that the extremes of heat and cold to which our country is subject, would affect the action of the spring. A trial of two or three years on different roads, and under all circumstances, has fully demonstrated that a spring properly cured is entirely unaffected by any extreme known to our climate. Its durability and its freedom from accidents are additional arguments in its favor; and its use for springs will soon become as common as is the use of iron for the axles of cars and locomotive.

Portland, Nov. 27, 1849.

#### OPENING OF THE ANDROSCOGGIN AND KENNEBEC RAILROAD.

The opening of the line of railway from Portland to Waterville, this day, was celebrated in a manner befitting the occasion. The accomplishment of so large a work, in the comparatively short time in which it has been in progress, through the exertions and with the means of the people of the state, almost exclusively, has excited the admiration of all. Very few, if there is in fact more than a single enterprise in the whole country, involving an equal amount of expense, that has been achieved in the same length of time. At any rate, considering the comparative means of the people who have carried this work through, with those of others in different portions of New England, it is an achievement of which Maine may well be proud.

The work was commenced in July, 1847, and 55 1-2 miles of expensive railway finished in November, 1849, or a little more than two years time.

The line of this railway embraces from the Atlantic and St. Lawrence railroad at Danville, 27 miles from Portland, and passing through the towns of Auburn, Lewiston, Greene, Leeds, Monmouth, Winthrop, Readfield & Belgrade, reaches the Kennebec river at Waterville, 83 miles from Portland. It is an expensive line, involving an amount somewhat beyond the original estimates, from the superior character of the work. It has the same width of track (5 1-2 feet) as the Atlantic and St. Lawrence railroad, and a rail of the same (bridge) pattern, and of the same weight, requiring 100 tons to the mile. The bridges, wood crossings, etc., are principally built with a view to a double track, and all its works are of a permanent substantial character.

The road has been built without the assistance of Boston capital, and almost entirely from the means furnished at Portland, and on the line of the road. The influence of Boston capital has favored the Kennebec and Portland railroad, which is upon the narrow gauge, and is to extend from Portland to Augusta.

The rivalry between these two lines, has called into the railway service many of the ablest minds of the State, and awakened somewhat suddenly, throughout Maine, a spirit of enterprise heretofore unknown, and little dreamed of out of its own borders. Far from depreciating this state of things, I regard it as the most favorable agency for the future growth and prosperity of Maine, and a guar-

antee that she will in a few years rival the most proud portions of New England in successful enterprises, and as far surpass in population and wealth any other New England State, as she now does in the extent of her territory, her material advantages and resources.

This morning at 7 o'clock, the train consisting of 7 cars, left the Portland depot for Waterville, with several hundred stockholders and invited guests. The number increased at every station, and before reaching Winthrop every spot upon the platform the mail car and the engine was occupied. The new and splendid engine "Boutelle," named in honor of the President of the railroad company, took the train from the Danville junction to Readfield. Here it met the ponderous engine "Ticonic," (both built by the Portland Company) with some 500 passengers, from Waterville and the intermediate stations.

The "Ticonic" was then turned again towards Waterville, and at a few minutes past 12 o'clock, the train, now numbering some 1,500 people in all, approached the Waterville station through a cut 40 feet in depth and the tenth of a mile in length thro' a ridge which rises gradually towards the east, and falls off abruptly towards the village of Waterville. An immense concourse of people lined both sides of this long cut, and pieces of artillery were planted on the summit, which announced the arrival of the train from Portland. The bells of the town answered back, and the shouts and huzzas of the multitude rent the air with prolonged and enthusiastic cheering. The day was bright and cheerful, the men, women and children of all the region round about had come to witness the long looked for coming of the cars, and all gave forth the earnest expression of their satisfaction. To many who passed over the road, the aspect of everything was new. The scenery along the whole line is beautiful and romantic. The crossing of the Androscoggin at the head of the Great Falls at Lewiston, the ride along the shores of the Winthrop Ponds, the lake at Belgrade, and the approach to Waterville, are points of rare attraction, with many others that might be named, the whole ride presenting a variety of scenery surpassing anything I have found on any other New England railway.

Every circumstance seemed to contribute to the pleasure of the occasion, and nothing occurred to mar or to interrupt the enjoyment of the day.

On reaching Waterville, the company was conducted by a committee of the citizens to the spacious freight depot, 250 feet in length, where tables were bountifully spread, and the Hon. S. P. Benson Treasurer of the company, on behalf of the people of Waterville bade them all a hearty welcome. In a few brief, pertinent and elegant remarks, he recounted the history of the enterprise, and acknowledged the good fortune which had crowned their efforts with success. Rev. Dr. Shelden, President of Waterville College, invoked the Divine blessing. About 2500 partook of the dinner, most bountifully spread by the public spirited people of Waterville, over which the Hon. Mr. Boutelle presided. After dinner he called in succession for Judge Preble of Portland, Hon. W. B. S. Moor of Bangor, Hon. David Kidder of Showhegan, Lot W. Morrell Esq. of Augusta, Josiah S. Little, Esq., President of the Atlantic and St. Lawrence railroad company, Hon. F. O. J. Smith, President of the York and Cumberland railroad company, J. B. Cahoon, Esq., Mayor of Portland, John A. Poor, Esq., of Portland, and William Paine, Esq. of Bangor, Marshall of Maine—who severally responded in appropriate terms.

The train left for Portland at 3 1-2 o'clock, and arrived at the depot at 8, without encountering accident or delay. At Waterville, the festivities of the dinner table gave way to a tea party in the same spacious building, and a ball held on far into the morning of the morrow.

Gentlemen from Bangor gave notice of their intention to invite the company to a similar repast on the shores of the Penobscot at an early day.

Our limits do not permit us to give the remarks of the speakers on the occasion, or to enumerate the distinguished men present from various parts of the State, who took part in the celebration, and who were prevented from speaking for want of time.

That this great trunk line will be rapidly pushed eastward to Bangor, to St. John City, and even to the Province of Nova Scotia, there can be no reasonable doubt. The feeling in Maine, in favor of railway improvements, to which we alluded last week, received an impulse from this celebration beyond that exerted on any former occasion.

#### Maryland.

##### Baltimore and Susquehanna Railroad.

We have received the annual report of the Directors of this company for the year ending September 30th ult., which presents the following statement of the financial condition of that company at that time, viz:

#### RECEIPTS.

From capital stock	....\$450,000 00
Loans, state of Maryland	1,844,045 29
City of Baltimore	850,000 00
Net transportation between Baltimore and Columbia	..... 561,623 31
Fines for private switches	..... 300 00
Sales of old iron	..... 6,303 50
lots in York	..... 485 00
	<hr/> \$3,752,757 10

#### EXPENDITURES.

For construction of road from Baltimore to York	.....\$2,611,012 90
Depots, water stations, and Real Estate	..... 73,489 69
Interest to State, city, & discount	..... 363,140 79
Stock of Wrightsville, York and Gettysburg railroad co	..... 121,205 37
Locomotives, Passenger and burden cars	..... 305,788 40
Patent rights	..... 6,528 22
Calvert Station	..... 23,932 47
Old Claims	..... 1,726 87
	<hr/> \$3,506,824 71

Showing a balance of .....\$245,932 39

Of this amount, \$171,064 80 is a debt due from the Wrightsville, York and Gettysburg railroad company. The income from the road the past year has been as follows:

Revenue between Baltimore and York.	
Passengers, No. 119,212	.....\$68,729 85
Merchandise, 372,011,951 lbs	..... 163,640 28
United States Mail	..... 5,833 33
	<hr/> \$238,203 46
Revenue between York and Columbia.	
Passengers, No. 23,940	..... 11,385 93
Merchandise, 162,198,885 lbs	..... 24,137 21
United States Mail	..... 1,166 67
	<hr/> 36,689 81
	<hr/> \$274,893 27

Expenditures on account of the road for the same time, and for tolls to W. Y. and G. railroad, and

the Columbia Bridge, for the same time, have been..... 185,580 07  
 Leaving a balance of..... \$89,213 20  
 In addition to this sum have been received the following, viz:  
 Interest from the Wrightsville, York and Gettysburg railroad..... 9,713 27  
 From same company for tracks to river at Writ'sville..... 7,494 67  
 From other sources..... 725 08

And have paid away  
 To the State of Maryland \$73,000 00  
 Legal expenses and costs..... 1,244 81  
 Calvert Station..... 22,048 16  
 Improvement of shops, depots, &c..... 7,051 10  
 Old Claims..... 1,726 87

Leaving..... \$2,175 28  
 Amount of funds available and unavailable 30th of September, 1848..... \$243,757 11  
 Amount of funds available and unavailable 30th of September, 1849..... 245,932 39 \$2,175 28

There has been an increase in the gross revenues of the company of \$34,026 98 as compared with the preceding year, being an increase of \$6,629 12 from passengers, and \$27,397 86 from tonnage.

The expenses of the transportation department exceed those of last year \$16,285 85. Of this sum \$8,029 34 was incurred in remodeling and rebuilding two old locomotives; and \$2,193 12 for new passenger cars. If these sums had been carried to a construction account, the excess in expenditures for transportation would have been only \$6,063 39, whilst the excess of receipts have been \$34,026 98.

In reference to the future prospects of the company, the President says:

It will be seen by reference to statements No. 4, the company has been able to pay the state during its fiscal year ending the 30th September, 1849, the handsome sum of \$73,000, (and within the States' fiscal year \$75,000) an increase on the amount paid last year of \$20,000. After paying for Calvert station (the cost of which is regularly met as the work progresses) and to provide the necessary power and cars, in expectation of a large increase of trade and travel to be thrown on the road by the completion of the extension railways, there can be no reasonable doubt of the ability of the company to remit a like sum next year. Without the least desire to create expectations which may not be realized, the opinion is confidently entertained, that with the completion of the connections, and the extension of the Pennsylvania railroads as far west as a junction with the state road at Hollidaysburg, this company will not only be able to resume the payment of its entire annual interest due the state, but maintain resumption and declare a dividend to its stockholders.

The connections alluded to are the York and Cumberland, the Harrisburg and Lancaster, the Pennsylvania, and the Ohio and Pennsylvania railroad companies, the former of which is a mutual extension of this line to Harrisburgh. When this is completed it will give to the Baltimore and Susquehanna all the benefit of the public works of Pennsylvania, and those connected with them.—Baltimore is nearer to Harrisburg than either Philadelphia or New York, and consequently nearer to the great West, the great source of trade, to secure which is the object of the vast public works of each. How far her favorable position in regard to distance, in addition to her fine harbor and climate will constitute this city a successful rival for this trade remains to be seen. At any rate, she will undoubtedly secure such a portion of it as will justify the completion of the works she has undertaken for this end.

We copy from the report the following

TABLE,  
 Showing the Distances between Baltimore and various points, in miles and hours on the presumption of a continuous railway connection. The passenger fare, and the freight on flour and dry goods, at the rate charged on the Baltimore and Susquehanna Railroad.

	Miles.	Hours	Fare	Freight.
				1 barrel Flour 100 lbs Dry Goods
Baltimore to York...	57	3 1/2	\$5 50	\$18 11 1/2
Do. to Harrisburg...	84	5 1/2	2 10 0	27 0 17
Do. to Carlisle.....	102	6 1/2	2 60 0	32 0 27
Do. to Chambersburg...	134	8 1/2	3 40 0	42 0 72
Do. to Lewistown.....	135	8 1/2	3 40 0	43 0 27
Do. to Hollidaysburg...	238	15	6 00 0	65 0 47
Do. to Pittsburg.....	334	21	8 40 0	\$1 05 0 67
Do. to Cleveland.....	463	29	11 72 1	48 0 93
Do. to Detroit.....	587	37	14 70 1	85 1 17

Distances of Cleveland and Detroit from Baltimore and New York.

	Baltimore.	New York.
Cleveland.....	469 miles.	645 miles.
Detroit.....	587 " "	755 " "

The time estimated is calculated on a speed of 16 miles per hour including stoppages.

#### ESTIMATES OF APPROPRIATIONS.

In pursuance of the joint resolution of January 7, 1846, which makes it the duty of the Secretary of the Treasury to cause the estimates of appropriations, which he is by law required to prepare and submit to Congress, to be printed, and copies of the same to be delivered to the Clerk of the House of Representatives in time for distribution at the commencement of each session, estimates of additional appropriations required for the service of the fiscal year ending June 30, 1850, and for the fiscal year ending June 30, 1851, were yesterday placed on the tables of the members of the House. From this volume we extract the summary of the additional appropriations required for 1850, and the appropriations asked for 1851.—*Washington Republican.*

#### TREASURY DEPARTMENT, November 16, 1849.

Sir: Agreeably to the joint resolution of Congress of the 7th January, 1846, I have the honor to transmit, for the information of the House of Representatives, printed estimates of additional appropriations proposed to be made for the service of the fiscal year ending the 30th June, 1850, amounting to..... \$1,696,851 47  
 All of which is on account of the civil list, foreign intercourse, and miscellaneous, including expenses of collecting revenue from customs and lands, from 1st January to 30th of June, 1850.

To the estimates is added a statement showing—

The indefinite appropriations for the service of the three last quarters of the fiscal year ending the 30th June, 1850, made by former acts of Congress, of a permanent character, amounting to..... 4,539,458 81

#### Viz:

Civil list, foreign intercourse, and miscellaneous..... \$583,580 41  
 Pensions..... 255,000 00  
 Interest, etc., public debt and treasury notes..... 3,700,878 40

\$6,236,310 28

I am, very respectfully

Your ob't servant,

W. M. MEREDITH,  
 Secretary of the Treasury.

Hon. Speaker  
 of the House of Representatives.

#### TREASURY DEPARTMENT, November 16, 1849.

Sir: Agreeably to the joint resolution of Congress of the 7th January, 1846, I have the honor to transmit, for the information of the House of Representatives, printed estimates of the appropriations proposed to be made for the fiscal year ending June 30, 1851, amounting to..... \$33,697,152 15

#### Viz:

Civil list, foreign intercourse and miscellaneous, including payment to be made to Mexico, under the 12th article of the treaty, expenses of collecting the revenue from customs and lands, census of 1850, public buildings, and expenses of courts..... \$12,812,480 29  
 Army proper, etc..... 5,866,137 00  
 Military academy..... 199,298 47  
 Fortifications, & ordnance, etc..... 1,647,446 00  
 Internal improvements, surveys & light houses..... 1,164,080 00  
 Indian department..... 998,739 17  
 Pensions..... 1,433,893 00  
 Naval establishment 9,575,078 22

To the estimates are added statements showing—

1. The appropriations for the fiscal year, ending the 30th June, 1851, made by former acts of Congress of a permanent character amounting to..... 5,643,410 24

#### Viz:

Civil list, foreign intercourse, and miscellaneous..... 724,560 14  
 Arming and equipping the militia..... 200,000 00  
 Civilization of Indians 10,000 00  
 Pensions..... 473,000 00  
 Interest on public debt 3,742,951 13  
 Purchase of stock of the loan of 1847.... 492,898 97

2. The existing appropriations required to be expended in the fiscal year ending the 30th June, 1851, amounting to..... 5,656,530 34

#### Viz:

Civil list, foreign intercourse and miscellaneous..... 472,519 21  
 Army proper, etc..... 2,230,747 97  
 Fortifications, ordnance etc..... 168,000 00  
 Internal improvements surveys, etc..... 83,123 38  
 Indian department..... 993,971 36  
 Pensions..... 20,117 00  
 Naval establishment..... 1,778,051 42

\$44,997,092 73

3. There is also to be added to the estimates a statement of the several appropriations, which will be carried to the surplus fund, amounting to..... \$502,170 02  
 Accompanying the estimates are sundry papers furnished by the Treasury, War, Navy and Interior Departments, containing references to acts of Congress, etc., on which the estimates are founded.

I am, very respectfully,

Your obedient servant,

W. M. MEREDITH,  
 Secretary of the Treasury.

Hon. Speaker  
 of the House of Representatives.

#### Virginia.

James River and Kanawha Co.

We have read the report of the President of this company, Hon. John Y. Mason, with the accompanying documents, recently submitted to the stockholders.

This important work, as our readers are aware, is nearly completed to Buchanan, a distance from Richmond of 196 miles—the portion unfinished being between Lynchburg and Buchanan, which we



learn will be completed next season. To complete the work the further sum of \$110,600 beyond the present means of the company will be required.

The following is the statement submitted of the financial condition of the company:

The capital stock of the company, under its present organization is 5,000,000 00  
Of this, individuals subscribed 841,500  
Corporations, 1,158,500  
The State, 3,000,000

The actual expenditure amounts to \$8,719,596 22

The company is now indebted:  
To the State, by bond 24th Feb. 1845, 268,645 33  
" " 25th Mar. '42, 250,000 00  
" for state stock issued, & to be issued, under act 1st March, 1847, 1,236,000 00  
To holders of Company's bonds, with the guarantee of the state, under act 23d March, 1839, 1,500,000 00

And when the works are completed for the connections authorized by the acts of 9th and 12th March, 1849, it will owe on its bonds guaranteed by the state, for these objects, 500,000 00

\$3,754,654 33

In addition to this large amount, is the perpetual annuity to the Old James River company, of twenty one thousand dollars.

The net am't of revenue received from the canal the past year was 175,639 49  
From dock at Richmond, 7,560 93  
From other improvements, 3,877 76

187,078 18

The annual liabilities of the company, when the works now in progress shall be completed, will be:

Annuity to the Old James River Co, 21,000 00  
Interest on company's bond to the state, given in 1845, 16,118 72  
Do. for loan 25th March, 1842, 15,000 00  
Do. bonds, guaranteed by the state, 90,000 00  
Interest on loan of state bonds for \$1,236,000, 1st Mfch, 1847, 74,160 00

Interest on guaranteed bonds for connections, 30,000 00

The estimated annual expense of works To Lynchburg, 60,000 00

The estimated annual expense on canal, from Lynchburg to Buchanan, 25,000 00

331,278 72

The resources of the company:

From the 1st division, estimated receipts, 280,000  
Estimated from dock, Rivanna, and other connections, 30,000  
Net income western improvements 8,000  
From 2d division, directly and incidentally, 120,000

438,000 00

Estimated net income, \$106,721 28  
on a capital stock of \$5,000,000.

Allowing the estimated receipts as within the mark, this would leave only about two per cent. for an annual dividend, and the President admits that the stockholders will find no compensating return from their stock, as a productive investment, and the large outlay made by the State will not prove a source of revenue, unless the improvement shall, in some form, reach the western terminus, which its projectors contemplated, and compete for the trade of the great valley of the Mississippi. He therefore recommends an application to the legislature for a loan of \$2,500,000, to extend the canal to Covington, and to render the Kanawha navigable to Gauley river.

To reach these points we presume that no greater difficulties will be encountered than those already

overcome. And the President of the company does not hesitate as to the policy to be pursued till these points are reached. As Covington lies at the foot of the Alleghenies, and as there commence the great obstacles to the connecting of the Chesapeake and Ohio by a canal, the President speaks with less confidence in reference to pushing the canal beyond this point, and admits that it is a debatable question, whether the connection shall be continued in the shape of a canal or railroad, though he inclines to the former mode. In this opinion he is supported by the chief engineer, Mr. Gwynn. In reference to this point we copy the following from the report of the President:

Of the character of this connection it will be expected that I should say something. I am aware that it is a subject on which diversity of opinion exists among the stockholders, and the success of the company depends so largely on harmony, that I would be extremely unwilling to do anything to disturb it.

When the company did me the honor to elect me to the office which I now hold, I had formed no opinion on the question. It became my duty to examine the subject and inform myself in regard to it as far as I could. The solution of the question depends on facts which are controverted, and requires an exact knowledge of the topography of the country, and on scientific skill, which I do not possess.

But in the candor which, I trust, will characterize my communications with the stockholders, so long as I bear any official relation to them, I will submit some suggestions, which appear to me worthy of consideration. The question is whether the connection shall be by a water line or canal, or by a railroad?

It must be remembered, that the James river and Kanawha improvement is essentially a thoroughfare for navigation, and as at both extremities it has been adapted to use as a water line, at so great a cost, and can only be used for the transit of boats, it is true policy to continue it as far as practicable, without transfer of freight from one mode of conveyance by water to another by land. Such shipments will add so largely to the cost of transportation as to destroy all the superiority of climate and position which the route now enjoys, and to give to other competitors for the western trade, with an uniform mode of transportation, such advantages as will seriously impair the value of the improvement. If it shall be determined to establish the connection by a railroad as the substitute for the water line, it appears to me that the mixed improvement will not and cannot remain as a continuous line of transportation. It can hardly be doubted, that the termini of the railroad across the mountains would not be stationary at the head of the company's water lines on either side of the mountain, but would be carried by new connections and extended works of the same kind to the Ohio in the west and tide water in the east; and although a portion of heavy freight, passing over the mountain might continue to use the canal, the trade could not be expected ever to realize the hopes, which may justly be entertained, if the connection can be so established as that the same boat can pass with its cargo undisturbed through the entire line. That there are difficulties attending the construction of the work, as a water line, cannot be questioned. But from my view of the country, its rugged face and geological structure, it appeared to me, that there will also be found serious difficulties in constructing a railroad. Every facility ought to be given to travel to the mountains with their invaluable mineral springs. But the improvement of the great central highway across the State has cost too much, and the return for the outlay depends too largely on a full development of agricultural and mineral resources, and on giving to the rich and heavy productions of the mountains and valleys of the west an avenue to market, to change its character merely to accommodate travel, when that may be effected without interference with the purposes and utility of our improvement. My opinion is clear and decided, that the water communication is the best for the company, and the most certain means of commanding transportation and enhancing the revenues and the value of the entire line

of the works if it be practicable. And I would recommend that the decision of the question be postponed until the water line can be carried as high on both sides of the Alleghany, as is undoubtedly practicable. In the mean time a careful survey should be made by a board of engineers, that the question may be settled whether the water communication across the Alleghany can be established and maintained. In making this suggestion I do not wish to be understood as discrediting the opinions expressed of the practicability of the measure by eminent engineers, now or heretofore laid before the stockholders. But the apprehension of an insufficient supply of water on the summit level, entertained by many, and on which my own mind is not fully satisfied, ought, as far as possible, to be removed, or confirmed, before a work of so much importance, and involving so much cost, is commenced.

It is obvious, from the exhibit which has been presented of the liabilities of the company, that its works should be extended gradually; and justice as well as policy, requires that the improvement of the western portion of the line should progress with that on the eastern side of the mountain.

**Arch St. Machine Shop.**  
**BIRKENBINE, MARTIN & TROTTER,**  
Makers of  
**STEAM ENGINES,**  
and  
**HYDRAULIC MACHINERY,**  
NO. 16 ARCH STREET,  
PHILADELPHIA,  
Will construct Steam Engines, Pumps, for Draining  
Mines and Land; supplying Water to Towns,  
Factories, Farms, etc;  
Also, Street Stops, Fire Plugs, Water Tanks, and  
Hydraulic Rams, with  
(BIRKENBINE'S PATENT VALVES.)  
B., M. & T. contract for Warming and Ventilating  
Buildings by Steam or Warm Water.

**J. E. Mitchell,**  
NO. 14 OLD YORK ROAD, PHILADELPHIA.  
Importer and manufacturer of  
New Castle }  
Nova Scotia } Grindstones, of all sizes and grits.  
Wickersley }  
French Burr }  
Cocaheo } Millstones, made to order, with all  
Cologne } the recent improvements.  
American and }  
Patent compressed } Fire Bricks and Tiles of various  
Garnkirk } sizes.  
Burr Blocks, Bolting Cloths, Mill Irons, etc.

BY FERDINAND E. WHITE.  
STORE NO. 22 LONG WHARF.

### Valuable Real Estate in South Boston.

On WEDNESDAY, December 19, at 12 o'clock, M. on the premises.

ALL the Property of the MASSACHUSETTS IRON COMPANY, consisting of their TWO MILLS, situated on Boston Harbor, at South Boston. Each Mill is 214 feet by 174, including Sheds. The two contain 15 double Puddling Furnaces, and nine Heating Furnaces.

There are two trains of Rolls in each Mill, altogether capable of manufacturing 1000 tons of rails per month. They are well located for the receipt and delivery of iron from vessels, with every convenience usually attached to such an establishment. There is connected with it, and will be sold at the same time, about 417,000 feet of upland, on which are erected, besides the mills, four blocks, containing each four brick Dwelling Houses for workmen; a wooden Counting Room, with Dwelling adjoining; a horse stable, and a coal shed 210 feet long by 70 feet wide, now containing 3100 chaldrons Pictou Coal, and 923 tons of Pig Iron.

The terms of sale will be made liberal. For further information apply to B. T. REED, Esq., or to the Auctioneer.

December 1, 1849.

**Cop Waste.**  
**CLEAN COP WASTE**, suitable for cleaning R.R. road, Steam boat and Stationary Engines, constantly on hand and for sale by  
**KENNEDY & GELSTON,**  
54 Pine St., New York.  
3m  
October 27, 1849,

**Wanted,**

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,  
President Buckfield Branch Railroad,  
Portland, Maine.  
November 10, 1849. 3145

**PATENT MACHINE MADE HORSE-SHOES.**

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,  
Troy Iron and Nail Factory, Troy, N. Y.

**Norwich Car Manufactory FOR SALE.**

WILL BE SOLD at public auction on the premises, on Wednesday, the 2d day of January next, at 10 o'clock A.M., the entire establishment and property of the Norwich Car Manufactory, consisting of

- 1 Brick, slate roof building, 50 by 150 feet, 2 stories, used for setting up cars, cabinet work, upholstery, etc.
- 1 Brick, slate roof building, 40 by 190 feet, 1 story, used for blacksmith and machine shop.
- 1 Brick, slate roof, engine and dry house, 30 by 40.
- 1 Lumber house.
- 2 Wood buildings, 50 by 64, and 54 by 120 feet, for painting and finishing cars.
- 1 Barn, 18 by 28 feet.
- 1 Wood dwelling house, 21 by 28 feet.
- 1 Brick block, six tenements, two stories.
- A number of building lots.

Together with all of the machinery, tools and fixtures connected with the same, consisting of—steam engine and boilers, several planing and sawing machines, turning lathes, boring, punching, morticing, and a variety of other labor saving machines, constituting as complete and extensive an establishment for the manufactory of Railroad Cars as any in the country, and capable of working one to two hundred hands, and doing a business of \$200,000 or more per annum.

It is situated on the Norwich and Worcester Railroad, half a mile from the city of Norwich, at the head of navigation of the River Thames, affording the most desirable facilities for the transportation of cars and materials, and in the immediate vicinity of various and extensive manufacturing and mechanical establishments. It has been in operation about two years, several of the buildings having been completed the present year. The whole, with the exception of the vacant lots, is leased on favorable terms for four years from February next. For further information apply to

J. G. W. TRUMBALL, } Trustees  
WALTER LESTER. }

October 24, 1849.

**TO CONTRACTORS.****SECOND LETTING OF THE MOBILE AND OHIO RAILROAD.**

SEALED Proposals will be received at the office of the Company at Mobile, until noon of SATURDAY, the 8th day of December, 1849, for the graduation, masonry, bridging, grubbing and clearing of sixty two miles, and for the manufacture and delivery of Track Timber for seventy miles of the Mobile and Ohio Railroad, beginning at and extending westwardly out of Mobile. Plans, profiles, specifications, &c., will be ready for inspection on and after the 1st day of November. The work will be divided into small sections, and persons bidding can propose for one or more, or for the whole work. Payments will be made monthly, but from 10 to 25 per cent. of the value of the work done will be retained as collateral security until the completion of the contract. The work is to be commenced immediately after the letting, and a reasonable time given for completion.

The seventy miles now advertised extends through the pine woods of Alabama, and over some sand and sand stone ridges—the whole length being as healthy at all seasons as any part of the United States. The work is worthy the attention of Northern and Western contractors, as those from the South.

It is expected that 200 or 250 miles of the route will be put under contract before the completion of the work now advertised for. Testimonials of character and ability to perform the work bid for, will be required of those not personally known to the President or Chief Engineer.

JOHN CHILDE, Chief Engineer.

**NOTICE TO Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE, }  
Washington City, D.C., April 28th, 1846. }

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,  
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York. 34tf

**ENGINEERS.**

**Arrowsmith, A. T.,**  
Buckfield Branch Railroad, Buckfield, Me.

**Banks, C. W.,**  
Civil Engineer, Vicksburg, Miss.

**Berrien, John M.,**  
Michigan Central Railroad, Marshall, Mich.

**Buckland, George,**  
Troy and Greenbush Railroad.

**Clement, Wm. H.,**  
Little Miami Railroad, Cincinnati, Ohio.

**Cozzens, W. H.,**  
Engineer and Surveyor, St. Louis, Mo.

**Davidson, M. O.,**  
Eckhart Mines, Alleghany Co., Maryland.

**Fisk, Charles B.,**  
Cumberland and Ohio Canal, Washington, D. C.

**Felton, S. M.,**  
Fitchburgh Railroad, Boston, Mass.

**Floyd-Jones, Charles,**  
South Oyster Bay, L. I.

**Gzowski, Mr.,**  
St. Lawrence & Atlantic Railroad, Montreal, Canada.

**Gilbert, Wm. B.,**  
Rutland and Burlington Railroad, Rutland, Vt.

**Grant, James H.,**  
Nashville and Chattanooga R. R., Nashville, Tenn.

**Harry, P.,**  
Binghamton, New York.

**Holcomb, F. P.,**  
Southwestern Railroad, Macon, Ga.

**Higgins, B.,**  
Mansfield and Sandusky Railroad, Sandusky City, O.

**Johnson, Edwin F.,**  
New York and Boston Railroad, Middletown Ct.

**Latrobe, B. H.,**  
Baltimore and Ohio Railroad, Baltimore, Md.

**Miller, J. F.,**  
Worcester and Nashua Railroad, Worcester, Mass.

**Morris, Elwood,**  
Schuylkill Navigation, Schuylkill Haven, Pa.

**Morton, A. C.,**  
Atlantic and St. Lawrence Railroad, Portland, Me.

**McRae, John,**  
South Carolina Railroad, Charleston, S. C.

**Nott, Samuel,**  
Lawrence and Manchester Railroad, Boston.

**Reynolds, L. O.,**  
Central Railroad, Savannah, Ga.

**Roebbling, John A.,**  
Trenton, N. J.

**Roberts, Solomon W.,**  
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

**Robinson, James P.,**  
Androscoggin & Kennebec Railroad, Waterville, Me.

**Schlatter, Charles L.,**  
Northern Railroad (Ogdensburg), Malone, N. Y.

**Stark, George.,**  
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

**Steele, J. Dutton,**  
Pottstown, Pa.

**Trimble, Isaac R.,**  
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

**Tinkham, A. W.,**  
United States Fort, Bucksport, Me.

**Thomson, J. Edgar.,**  
Pennsylvania (Central) Railroad, Philadelphia.

**Whipple, S.,**  
Civil Engineer and Bridge Builder, Utica, N. Y.

**Williams, E. P.,**  
Auburn and Schenectady Railroad, Auburn, N. Y.

**Williams, Charles H.,**  
Milwaukee, Wisconsin.

**BUSINESS CARDS.**

**DUNLAP'S HOTEL,**  
On the European Plan,  
NO. 135 FULTON STREET,  
Between Broadway and Nassau St.,  
NEW YORK.

**Manufacture of Patent Wire ROPE AND CABLES,**  
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by  
JOHN A. ROEBBLING, Civil Engineer,  
TRENTON, N. J.

**Samuel D. Willmott,**  
MERCHANT, AND MANUFACTURER OF  
CAST STEEL WARRANTED SAWS,  
IMPORTER OF THE  
GENUINE WICKESRLY GRINDSTONES,  
NO. 8 LIBERTY STREET,  
NEW YORK.

**Doremus & Harris,**  
ANALYTICAL & CONSULTING CHEMISTS,  
179 BROADWAY, NEW YORK.  
SCHOOL OF CHEMISTRY.

**Dudley B. Fuller & Co.,**  
IRON COMMISSION MERCHANTS,  
No. 139 GREENWICH STREET,  
NEW YORK.

**Cruse & Burke,**  
Civil Engineers, Architects and Surveyors,  
Office, New York State Institution of Civil Engineers,  
STATE HALL, ALBANY, N. Y.  
Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.  
May 26, 1849.



**Railroad Car Manufacturer's  
Furnishing Store.****F. S. & S. A. MARTINE,**  
IMPORTERS AND MANUFACTURERS OF**RAIL ROAD CAR &  
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,  
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsteds; Mo-  
reens, Rattinets, Cloths, Silk and Cotton Velvets,  
English Bunting**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-  
torney for Patents. Office and Laboratory, F St.,  
opposite the Patent office, Washington, D. C.**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,  
Lake Superior.**Starks & Pruyn,**MANUFACTURERS OF ALL KINDS OF  
**STEAM BOILERS,**

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner  
Wm. F. Pruyn, R. H. Pruyn.  
Iron Railing, Bank and Vault Doors, Iron Shutters  
Bridge and Roof Bolts, Heavy Jobbing and Forging  
of all kinds.

For particulars see Adv. in another column.

**To Engineers and Surveyors.****E. BROWN AND SON** Mathematical inst. mak-  
ers No. 27 Fulton Slip, New York, make and keep  
for sale, Theodolites, Levelling inst., Levelling rods,  
Surveyors Compasses, and Chains, Cases of Mathe-  
matical drawing insts. various qualities, together with  
a general assortment of Ivory Scales and small insts.  
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**  
WILLOW ST. WHARVES, PHILADELPHIA.**AGENTS** for the sale of Charcoal and Anthracite  
Pig Iron, Hammered Railroad Car and Locomo-  
tive Axles, Force Pumps of the most approved con-  
struction for Railroad Water Stations and Hydraulic  
Rams, etc., etc.  
July, 27, 1849.**James Laurie, Civil Engineer,**

No. 23 RAILROAD EXCHANGE, BOSTON, MASS.

Railroad Routes explored and surveyed. Estimates,  
Plans and Specifications furnished for Dams, Bridges,  
Wharves, and all Engineering Structures.

October 14, 1848. 6m\*

**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,  
PENSACOLA, FLORIDA.,

PATENTEE OF THE

**HERRON RAILWAY TRACK.**Models of this Track, on the most improved plans,  
may be seen at the Engineer's office of the New York  
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—  
SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,  
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,  
Tender, and Car Wheels—made from the best Ameri-  
can Iron. Address **E. S. NORRIS.**  
May 16, 1849.**Machinery Warehouse.****S. C. HILLS,** No. 43 Fulton street, New York, has  
constantly for sale Steam Engines, Boilers, Lathes,  
Chucks, Drills, Planers, Force and Suction Pumps;  
Tenoning, Morticing and Boring Machines, Shingle  
Machines, Bolt and Nut Machines, Belting, Oil, Iron  
and Lead Pipe; Rubber, Percha and Leather Hose,  
&c., &c.**S. C. H.'s** arrangements with several machine shops  
are such that he can supply, at very short notice, large  
quantities of machinery.

November 23, 1849.

**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,  
TROY, N. Y.**Hudson River Foundry,  
THOMAS & COLLINS,**

130 Quay Street, Albany.

**To Railroad & Navigation Cos.****Mr. M. Burr Hewson, Civil Engineer,** offers his  
services to Companies about to carry out the surveys  
or works of a line of Navigation or Railroad. He can  
give satisfactory references in New York City as to his  
professional qualifications; and will therefore merely  
refer here to the fact of his having been engaged for  
upwards of two years conducting important Public  
Works for the British Government.Communications will find Mr. Hewson at the office  
of the Railroad Journal, 54 Wall Street, New York.**J. T. Hodge,**

No. 1 New street, New York.

**Manning & Lee,****GENERAL COMMISSION MERCHANTS,  
NO. 51 EXCHANGE PLACE,  
BALTIMORE.**Agents for Avalon Railroad Iron and Nail Works.  
Maryland Mining Company's Cumberland Coal 'CED'  
—'Potomac' and other good brands of Pig Iron.**IRON.****Railroad Iron.**500 Tons, afloat, weighing 57 pounds per lineal  
yard, for sale by**COLLINS, VOSE & CO.,**

158 South St.

New York, November 17, 1849. 1m46

**Railroad Iron.****THE UNDERSIGNED, Agents for Manufacturers,** are  
prepared to contract to deliver Rails of superior  
quality, and of any size or pattern, to any ports of dis-  
charge in the United States.**COLLINS, VOSE & CO.,**  
158 South St.

New York, November 17, 1849.

**Railroad Iron.**

1600 Tons, weighing 60½ lbs. per yard.

185 " " 57½ "

550 " " 53 "

of the latest and most approved patterns. For sale by  
**BOORMAN, JOHNSTON & CO.,**

119 Greenwich street.

New York, Oct. 13, 1849.

**Railroad Iron.****THE UNDERSIGNED** have on hand, ready for immedi-  
ate delivery, various patterns of Iron Rails, of  
best English make, and manufactured in conformity  
with special specifications.They offer also to import and contract to deliver  
ahead—on favorable terms.**DAVIS, BROOKS, & CO.,**

68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved  
Rail—and specifications of quality and make of same,  
are on hand at their office, for examination of parties  
who may desire to inspect the same. **D., B. & Co.**  
Oct. 11, 1849.**MANUFACTURE OF PATENT WIRE ROPE**  
and Cables for Inclined Planes, Standing Ship  
Rigging, Mines, Cranes, Tillers, etc, by  
**JOHN A. ROEBLING, Civil Engineer,**

Pittsburgh, Pa.

These Ropes are now in successful operation on the  
planes of the Portage railroad in Pennsylvania, on the  
Public Slips, on Ferries, and in Mines. The first rope  
put upon Plane No. 3, Portage railroad, has now run  
four seasons, and is still in good condition.**Railroad Iron.****THE UNDERSIGNED** offer for sale 3000 Tons Railroad  
Iron at a fixed price, to be made of any required  
ordinary section, and of approved stamp.They are generally prepared to contract for the deliv-  
ery of Railroad Iron, Pig, Bar and Sheet Iron—or  
to take orders for the same—all of favorite brands, and  
on the usual terms.**ILLIUS & MAKIN.**

41 Broad street.

March 29 1849. 3m.13

**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,  
Square " Flat " Scroll "Axles, Locomotive Tyres,  
Manufactured at the Glendon Mills, East Boston, for  
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &  
BOAT SPIKES.**—The Albany Iron Works  
have always on hand, of their own manufacture, a  
large assortment of Railroad, Ship and Boat Spikes  
from 2 to 12 inches in length, and of any form of head  
From the excellence of the material always used in  
their manufacture, and their very general use for rail-  
roads and other purposes in this country, the manu-  
facturers have no hesitation in warranting them fully  
equal to the best spikes in market, both as to quality  
and appearance. All orders addressed to the subscrib-  
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.  
The above Spikes may be had at fact: prices, of  
Erastus Corning & Co. Albany; Merritt & Co., New  
York; E. Pratt & Br: 1 at, Es: 2 more, Md.**LAP—WELDED****WROUGHT IRON TUBES**

FOR

**TUBULAR BOILERS,**

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality  
and manufacture as those so extensively used in  
England, Scotland, France and Germany, for Lo-  
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York.

**Railroad Iron.****THE UNDERSIGNED ARE PREPARED TO**  
contract for the delivery of English Railroad Iron  
of favorite brands, during the Spring. They also re-  
ceive orders for the importation of Pig, Bar, Sheet, etc.  
Iron.**THOMAS B. SANDS & CO.,**  
22 South William street,

February 3, 1849.

New York.

**Iron Store.****THE SUBSCRIBERS,** having the selling agency of the  
following named Rolling Mills, viz: Norristown,  
Rough and Ready, Kensington, Triadelphia, Potts-  
grove and Thorndale, can supply Railroad Companies,  
Merchants and others, at the wholesale mill prices for  
bars of all sizes, sheets cut to order as large as 58 in.  
diameter; Railroad Iron, domestic and foreign; Loco-  
motive tire welded to given size; Chairs and Spikes;  
Iron for shafting, locomotive and general machinery  
purposes; Cast, Shear, Blister and Spring Steel; Bol-  
ter rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.  
August 16, 1849. 1y33**Railroad Iron.****THE MOUNT SAVAGE IRON WORKS, AL-**  
legany county, Maryland, having recently pass-  
ed into the hands of new proprietors, are now prepar-  
ed, with increased facilities, to execute orders for any  
of the various patterns of Railroad Iron. Communi-  
cations addressed to either of the subscribers will have  
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

**ERASTUS CORNING, Albany.****WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

**Railroad Iron.****THE SUBSCRIBERS ARE PREPARED TO**  
take orders for Railroad Iron to be made at their  
Phoenix Iron Works, situated on the Schuylkill Riv-  
er, near this city, and at their Safe Harbor Iron Works,  
situated in Lancaster County, on the Susquehanna  
river; which two establishments are now turning out  
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly  
supplied with rails of any required pattern, and of the  
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

**Monument Foundry.**

**A. & W. DENMEAD & SON,**  
Corner of North and Monument Sts.,—Baltimore,  
HAVING THEIR

**IRON FOUNDRY AND MACHINE SHOP**

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses,

Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

**Iron Wire.**

**REFINED IRON WIRE OF ALL KINDS,**  
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

**American and Foreign Iron.****FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " "

100 " 2, " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " "

50 " Catoctin " "

250 " Chikiswalungo " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

**American Pig, Bloom and Boiler Iron.**

**HENRY THOMPSON & SON,**

No 57 South Gay St., Baltimore, Md.,  
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.  
Baltimore, June 14, 1849. 6 mos

**LAP-WELDED WROUGHT IRON TUBES**  
for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,

12 Platt street, New York.

**JOB CUTLER, Patentee.**

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

**Railroad Iron.**

**THE TRENTON IRON COMPANY ARE NOW** turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

**Pig and Bloom Iron.**

**THE** Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,  
Vine Street Wharf, Philadelphia.

**Iron.**

**THE** SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

**WILLIAM JESSOP & SONS'****CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory,

**PARK WORKS, SHEFFIELD,**

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

**SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.**

The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

J. F. WINSLOW, Agent,

Albany Iron and Nail Works.

**JOHNSON, CAMMELL & Co's****Celebrated Cast Steel,****AND****ENGINEERING AND MACHINE FILES,**

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23, 1849.

**American Cast Steel.**

**THE ADIRONDAC STEEL MANUFACTURING CO.** is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.  
May 28, 1849.

**To Steam Engine Builders.**

**THE** Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**Railroad Instruments.**

**THEODOLITES, TRANSIT COMPASSES,** and Levels, with Fraunhofers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

**Mattewan Machine Works.**

**THE** Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also Tenders, Wheels, Axles, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

**STATIONARY ENGINES, BOILERS, ETC.,**

Of any required size or pattern, arranged for driving Cotton, Woollen, or other Mills, can be had on favorable terms, and at short notice.

**COTTON AND WOOLLEN MACHINERY,**

Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

**MILL GEARING,**

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

**TOOLS.**

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fish-kill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

**Text Book of Mechanical Drawing,**

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to Isometrical drawing, with 4 plates of examples.

4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES.

Published by WM. MINIFIE & CO.,

114 Baltimore St., Baltimore, Md.

Price \$3, to be had of all the principal booksellers.



**To Railroad Companies.**

**FOR SALE**—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**  
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Omond & Co., Car-builders, Broad st., Philadelphia.  
September 6, 1849.

**LAWRENCE'S ROSENDALE HYDRAULIC Cement.** This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by **JOHN W. LAWRENCE,**  
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

**NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts.** This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee. **G. A. NICOLLS,**  
Reading, Pa.

**To Railroad Companies and Contractors.**

**FOR SALE**—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**  
Prest. Beaver Meadow Railroad & Coal Co.,  
Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**  
at Beaver Meadow, Pa.

May 19, 1849. 20tf

**India-rubber for Railroad Cos.**

**RUBBER SPRINGS**—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

**HORACE H. DAY,**

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

**Fire Brick.**

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

**ROOFING SLATES,**

from the best Welch quarries, and of all sizes. Also,

**COAL,**

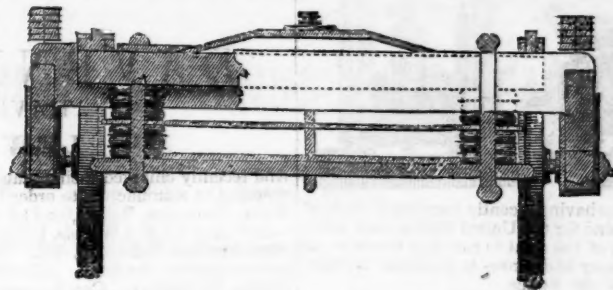
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

**SAMUEL THOMPSON & NEPHEW,**

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**FULLER'S PATENT INDIA RUBBER CAR SPRINGS.**

**RAILROAD COMPANIES** are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

**W. C. FULLER,**

The only persons authorised to supply the Springs

are **G. M. KNEVITT, 38 Broadway, N. York,**

General Agent for the U. S.; and

**JAS. LEE & Co., 19 India Wharf, Boston.**

**JOHN THORNLEY, Chestnut st., Philad.**

**Steam Boiler Explosions.**

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent,

**JOSEPH P. PIRSSON,**

Civil Engineer, 5 Wall st.

**To the Proprietors of Rolling Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

**F. & T. TOWNSEND.**

Albany, August 18, 1849.

**TO LOCOMOTIVE AND MARINE ENGINE**

Boiler Builders. Pascal Iron Works, Philadelphia. Welded Wrought Iron Flues, suitable for Locomotives, Marine, and other Steam Engine Boilers, from 2 to 5 inches in diameter. Also, Pipes for Gas, Steam and other purposes; extra strong Tube for Hydraulic Presses; hollow Pistons for Pumps of Steam Engines etc. Manufactured and for sale by

**MORRIS, TASKER & MORRIS,**

Warehouse S. E. corner 3d and Walnut streets,  
Philadelphia.

**The New York Iron Bridge Co.**

LATELY KNOWN AS

**Rider's Patent Iron Bridge Co.**

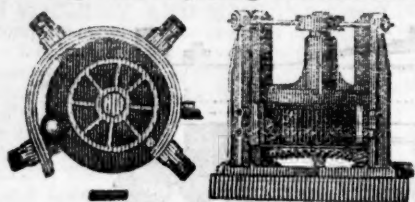
THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same.

August 4th, 1849.

**M. M. White, Agent,**  
No. 74 Broadway, New York.

au7tf

**MACHINERY.****Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

**Railroad Spikes and Wrought Iron Fastenings.**

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,  
Troy Iron and Nail Factory, Troy, N. Y.

**RAILROAD WHEELS.**

**CHILLED RAILROAD WHEELS.**—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,  
Willow St., below 13th,  
Philadelphia, Pa.

**CHILLED RAILROAD WHEELS.**—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,  
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,  
March 12, 1848.

A. T.

**ENGINE AND CAR WORKS.****DAVENPORT & BRIDGES,**

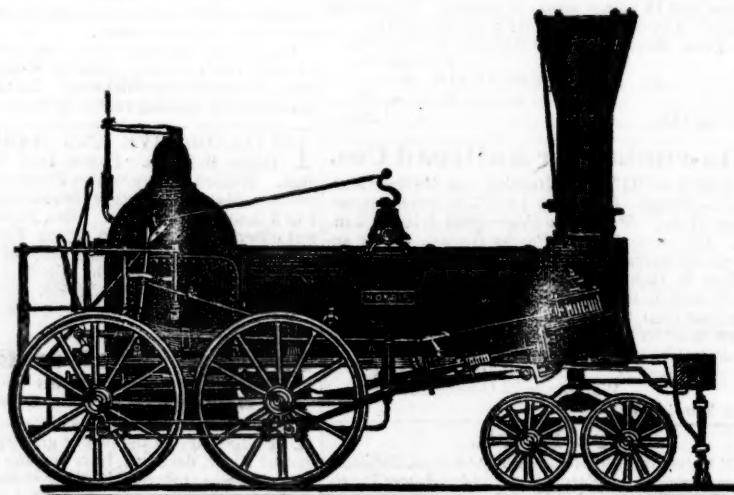
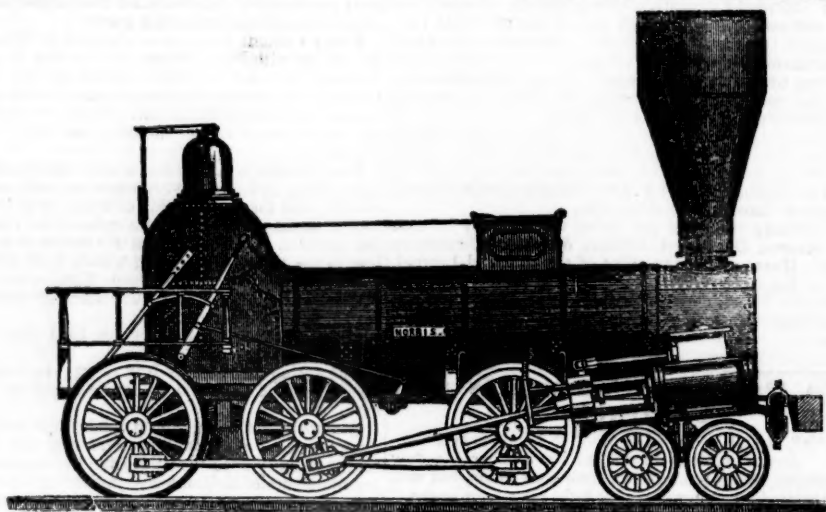
HAVING ASSOCIATED WITH THEM

MR. LEWIS KIRK, OF READING, PA.,

And recently enlarged their Establishment, (making it now the most extensive in the United States,) they are prepared to manufacture to order Locomotive Engines and Cars of every description. Stationary Engines, Steam Hammers, Boilers, and all kinds of Railroad Machinery. Also, Castings and Forge Irons of all kinds—including Chilled Wheels, Frogs, Chairs, Switches, Car Axles, and Locomotive Cranks, Connecting Rods, Steel Springs, Bolts, etc., etc. Orders from all parts of the country solicited for Engines and Cars, or any part or parts of the same. All orders will be furnished at short notice, and on as good terms as any manufactory in the country. Coaches pass our works every fifteen minutes during the day, from Brattle St., Boston.

DAVENPORT, BRIDGES & KIRK.

Cambridgeport, Mass., February 16th, 1849.

**NORRIS' LOCOMOTIVE WORKS.**  
**BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,**

**THE UNDERSIGNED** Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS